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# Keeping It In Context: Examining Spatial Stratification of College Attendance for Rural, Urban and Suburban Students

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Though rural schools have closed a long-standing high school graduation gap compared with urban schools, they struggle to achieve parity in college graduation rates. Sociology of education literature on college attendance explains this stratification using race/ethnic or social class differences, but has not fully explored spatial stratification comparing urban, suburban **and** rural students. Stratification research is typically rooted in status attainment and social reproduction theories, yet these frameworks rarely situate student outcomes in spatial context. Using data from the Education Longitudinal Study of 2002, I examine the spatial stratification of factors related to college attendance, using these factors to predict the likelihood of postsecondary enrollment. I contribute to the literature by examining how traditional factors affecting college enrollment differ in suburban, urban, and rural contexts by assessing the spatial stratification of enrollment by post-secondary institutional type. I incorporate two new explanations of likelihood of college enrollment that are salient for rural students: proximity to nearest institution and technological capital.

While no spatial context maintains an advantage in terms of noncognitive resources, there is variation in the impact of these resources on the likelihood of college enrollment. Urban students' parents maintaining college-going aspirations and greater technological capital boost students' chances of enrollment. Suburban students benefit from noncognitive resources and from supportive social networks established by parents or peers. In rural contexts, various types of school involvement, supportive parents with college-going aspirations, and supportive social

networks predict greater likelihood of attending college. I also show that technological capital positively predicts the likelihood of post-secondary enrollment regardless of institutional type for urban and suburban students, but distance matters only for suburban students. While prior achievement and aspirations are important for all students, the various factors associated with college enrollment that are examined in this project are better at predicting enrollment in four year versus two year institutions and more of these factors are significantly related to enrollment for students from suburban schools compared to rural or urban students. Future research should pay attention to the important ways in which geography directly and indirectly shapes student's pathways to college enrollment.

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Rural, Urban and Suburban Students

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# CHAPTER 1: INTRODUCTION

## 1.1 Introduction

The American higher education system has changed tremendously in the past 50 years (Arum and Roksa 2010; Baum and Schwartz 2012; Reed et al. 2011; Taylor et al. 2011). From access, to demographics, to cost, scholars, politicians, and the public are debating how these changes will affect individual student outcomes as well as the utility and sustainability of the system as a whole. Students are enrolling in higher education at greater rates than they have in the last fifty years (Hussar and Bailey 2013; Snyder and Dillow 2011). Gender parity in enrollment is at its highest in the last forty years (Buchmann and DiPrete 2006; Hussar and Bailey 2013), and after decades of race/ethnic and social class stratification, we are also seeing more students from under-represented racial/ethnic minority groups and low-income backgrounds enrolling in post-secondary institutions (Espenshade and Radford 2009).

Though more students have access to higher education, campus life remains polarized in many ways. Students from traditionally under-represented minority groups report struggle with social life on campus (Aries 2008; Charles et al. 2009) and many low-income students under great financial strain must work instead of engage with campus life in order to finish their degree (Grigsby 2009; Stuber 2011). We also see great financial strain on the higher education system as a whole. The cost of post-secondary education has risen at an alarming rate while income and earnings have hardly kept pace, raising important questions about higher education's "affordability" (Baum and Schwartz 2012). Students graduating from post-secondary institutions are facing a high unemployment rate, an overburdened labor market and bleak job prospects (Danziger and Ratner 2010). College graduates shoulder greater debt burden than they ever have, making it difficult to save for future personal investments like a home (Reed et al.

2011). In the face of increased access and questionable decrease in returns, in the popular and academic press, scholars and journalists have written and wondered, "What is the value of a college education?" and "Is a college education worth it?" (Baum and Schwartz 2012; Reed et al. 2011; Taylor et al. 2011).

Despite this academic debate, trends in high school graduation rates and subsequent college graduation rates are on the rise (see Table 1.1, page 12) and the belief that education is the key to the American dream remains part of the national consciousness. In his 2012 State of the Union Address, President Obama called on young people to invest in any form of post-secondary education *or* training that would enhance both their own job prospects as well as the larger American workforce. This persistent belief in the value of education is one reason individuals pursue higher education (Johnson 2006), but there is a tension in the popular discourse over the value of a college education. With higher education enrollment projected to increase over the next ten to fifteen years, even with this rising doubt regarding the value of higher education, more people still plan to pursue a post-secondary degree (Hussar and Bailey 2013).

Despite the debates over the value of higher education, college degree holders experience economic and social returns in unprecedented ways compared to earlier generations of college graduates (Hout 2012; Torche 2011). Research has consistently shown that people with more education accumulate social, health and economic advantages over the course of their lifetime (Card 2001; Kingston et al. 2003). Post-secondary credentials remain crucial for occupational success and financial security in the current economy and increasing college enrollment rates reflect the public's investment in the importance of post-secondary education (Collins 2002; Danziger and Ratner 2010; Gamoran 2001). These social, health and financial benefits are not

equally distributed to communities around the country, however. Sociologists studying higher education have examined the ways that access to higher education may be stratified and the ways that public secondary education has stratified student achievement, but they have paid less attention to the differences across these spatial contexts (Stevens et al. 2008).

There is evidence that class stratification can transcend generations and to avoid future educational segregation, we must pay greater attention to spatial stratification of achievement and college attendance. In Table 1.2 (see page 13), while we see high school graduation rates and college enrollment rates are on the rise for students coming from urban, suburban, and rural contexts, we do not have evidence that these students return back to further enrich their hometown life. As college enrollment rates rise in all spatial contexts, these educated people tend to congregate in specific regions of the country, leading to educational segregation (Ryan and Siebens 2012). With the glut of college educated people living in specific places, the social, economic and health benefits associated with their education go with them. This increasing educational segregation situates some communities, specifically rural communities, at a disadvantage when it comes to these social, health and economic advantages (Domina 2006). In Figure 3 (see page 14), we see evidence of this educational segregation around metropolitan communities across the country. With projections of increased post-secondary enrollment over the next ten years, it is possible that educational segregation will become more concentrated (Hussar and Bailey 2013). This means with a more educated society, we do not see the kinds of individual and societal benefits for all communities.

Existing sociology of education literature has devoted greater attention to K-12 outcomes and spent limited time on the study of higher education (Deil-Amen and Turley 2007; Grodsky and Jackson 2009). The sociological literature on higher education focuses largely on issues of

preparedness like achievement or aspirations and issues of access including enrollment and application, and in a limited way persistence/attainment and financing. While there is sufficient understanding of the race/ethnic, class and gender stratification of factors related to college preparedness, there are fewer studies of how factors related to college access might vary along spatial lines (Stevens 2007). Scholarship examining spatial stratification of education outcomes has consistently focused on the impact of urbanicity (Eccles and Roeser 2011; Lichter et al. 1993; Reeves and Bylund 2005; Roscigno and Crowley 2001; Stearns and Glennie 2010; Turley 2009), while rural contexts are frequently considered too idiosyncratic in terms of resources, amenities and human capital to inform large-scale educational policy (DeYoung 1987; Khattri et al. 1997). Scholars have also concentrated less attention on connections between achievement and college matriculation to understand why rural students would be further disadvantaged by their context.

Finally, not all college attendance is created equal. Having a post-secondary credential is important for social mobility, but there is a difference between a four-year and a two-year credential. When sociologists study the likelihood of college attendance, they focus on traditional, four-year institutions, and often, they further concentrate on elite institutions. These four-year schools may represent a best-case scenario for understanding college enrollment, however the broader higher education system in complex and varied. There is evidence that college attendance in its various forms yields different kinds of benefits depending on students' social class origins and future occupational choices (Brand and Xie 2010; Hout 2012). Rather than lumping these outcomes together or ignoring students enrolled in two-year institutions, I examine the differences in the likelihood of enrollment in different institutional types.

## 1.2 Research Questions

In this project, I study the factors related to college attendance and the ways these factors vary depending on spatial context. I contribute to the literature by considering spatial context centrally in the analysis and by parsing out the factors related to the likelihood of attendance at either two-year or four-year institutions. Rising post-secondary enrollment at a time of increasing educational segregation is the issue driving this research. I concentrate on spatial stratification of the factors related to, as well as the likelihood of, college attendance. While this overarching concern guides the project, I examine features of spatial contexts that impact immediate college attendance after high school graduation. Using data from the Education Longitudinal Study of 2002 (ELS), I address four analytical questions.

1. What are the contextual differences in noncognitive resources (parental aspirations, technological capital and social capital)?

2. What are the contextual differences in the way these noncognitive resources (combined with other factors) affect students' college-going aspirations?

3. What are the contextual differences in the way these noncognitive resources (combined with other factors) and college-going aspirations affect high school math achievement?

4. What are the contextual differences in the way these noncognitive resources (combined with other factors), students' college-going aspirations and high school math achievement affect the likelihood of either two-year or four-year college attendance?

By considering spatial context, I extend our understanding of how the factors related to the likelihood of college attendance vary between rural, urban, and suburban places. Figure 1.1 on page 14 provides a visual representation of the models explored in the analytical phase of this project. In this figure, I show how the analytical chapters build upon one another to understand spatial variation in predictors of college attendance.

### 1.3 Contributions

This project adds to the sociological literature on higher education in several ways. First, I conduct a contextual analysis to understand how factors related to the likelihood of college attendance vary along spatial dimensions. Previous studies of spatial context have generally lumped spatial groups together, making comparisons between urban and non-urban places or rural and non-rural places. The focus on either urban or rural contexts also obscures what is happening in suburban places. While some research shows that urban and rural students under-perform when compared to suburban students, there are fewer analyses of college attendance separating these three spatial designations to explore and understand how factors are associated with separate contexts (Roscigno et al. 2006). The National Center for Education Statistics (NCES) assigns these categories using Census designations, so these categories capture a spectrum of population density from high concentration of people (urban) to diffuse concentration of people (rural). This project seeks to understand how rural places are both similar to and different from both urban and suburban contexts. While we understand some of the factors related to college preparedness or college access, few studies consider spatial context as centrally as I do in this project. My analyses show instances where pooled models of public school students resemble contextual analyses for some predictors of college attendance. There are, however, notable differences between pooled and contextual models for achievement and college attendance.

Secondly, the sociology of higher education literature focuses largely on the experiences of students in elite institutions. The analysis in this project broadens the literature on institutional type and adds to out understanding of college access. In this analysis, I find similar explanations for the likelihood of college attendance in a specific institutional type. That is,

though we understand that students prepare for post-secondary attendance, not all preparatory activities are necessary for students depending on their institutional choice. For instance, engagement with the extracurriculum is an important predictor of students' success in every analytical chapter, including the likelihood of attending a four-year college. However, this measure is not significantly related to the likelihood of attending a two-year college. These kinds of nuances in our understanding of college attendance are evident in the final analytical chapter.

Thirdly, in conducting analyses comparing urban, suburban and rural places, this project adds to the limited scholarship on rural education outcomes by addressing the disconnect between high school achievement and post-secondary matriculation in context. Rural regions of the country are experiencing a "hollowing out" or "brain drain" of educated individuals as these people cluster in metropolitan places (Carr and Kefalas 2009; Domina 2006), yet there is evidence that not all academically competent rural students will leave their hometown. Demi et al. (2010) find that rural students staying engaged in high school form higher aspirations. While family investments are important, school climate is more strongly related to higher levels of enrollment. In this analysis, I show that school characteristics do not impact the likelihood of enrollment in the same way for all spatial contexts. If rural contexts can continue to send students to pursue post-secondary education and bring them home, perhaps "brain drain" or increased educational segregation will not be as detrimental to these rural places.

A fourth important contribution of this project is the inclusion of variables that approximate exposure to post-secondary education, including technological capital and distance to the nearest college or university. Scholars are beginning to expand our understanding of factors other than demography, cognitive ability or noncognitive resources that explain

stratification of student outcomes. Including technological capital provides a start on understanding how innovations in technology may impact student success. As such, the analysis addresses (albeit in a simple manner), the importance of technology for increasing the likelihood of college attendance. The measure of distance to the nearest institution also represents an innovation in this analysis. Students who live at a distance are less likely to apply to college (Turley 2009). Physical distance may mean that some students do not have the chance to envision themselves on a college campus. Without physical exposure to college life, some students struggle with adjustment and persistence through to attaining their degree (Aries 2008; Stuber 2011). This measure proved important for understanding variation in students' cognitive outcomes and for their likelihood of college attendance.

Finally, this project has important implications for education policy designed to democratize access to post-secondary opportunities for all students. There is a tension in rural places between buying into and rejecting the rewards of education. Affinity for one's hometown may be a deterrent to leaving for post-secondary education (Petrin et al. 2011). Buying into the system means potentially abandoning one's community while rejecting the system may lead to financial insecurity and struggle in the labor market. Carr and Kefalas (2009) find that rural communities and school administrators are complicit in the issue of brain drain. That is, they know and understand that their investments in only high achieving students are associated with local economic decline. While brain drain represents a problem for these communities, investing in education may be one way to improve the health of local rural economies. It is important that all students, regardless of their hometown context, pursue post-secondary education if we have any hope of reinvigorating rural towns across the country. If local education governance is unable or unwilling to incentivize the pursuit of post-secondary education, perhaps the federal

government will assume a greater responsibility for investing in educational opportunities in all communities.

While pursuing a post-secondary degree may lead to educational segregation in the short term while students are away completing their bachelor's or associate's degree, local political and school leaders must find ways to lure these college-educated citizens back home if their spatial context is to benefit from having more educated citizens. According to Table 1.1, rural high school graduation rates are already on par with graduation rates in other spatial contexts. If a greater proportion of these high school grads pursue a post-secondary degree, then rural communities have a larger pool to attract back to their hometown after college graduation. With greater attention to spatial context, I hope to uncover factors that urban, suburban or rural places could consider to encourage post-secondary pursuits and ultimately bring those college-educated folks home. The majority of education reform designed to equalize access to post-secondary opportunities focuses on inequality between urban and non-urban, lumping rural and suburban students together or overlooking rural contexts altogether.

### 1.4 Outline of Chapters

This project includes eight chapters. In this first chapter, I introduced the overarching research question as well as four analytical approaches to understanding spatial stratification in the likelihood of college attendance. This chapter builds the framework for understanding potential contextual differences in students' post-secondary outcomes.

In Chapter 2, I review the literature on college attendance, paying close attention to some of the cognitive and noncognitive predictors of college attendance. Cognitive measures include high school achievement and noncognitive predictors include parental aspirations, technological,

and social capital, and students' college-going aspirations. Then, I highlight my contributions to the limited literature on spatial stratification of these outcomes.

In Chapter 3, I describe the measures and methods that I employ in the analysis. First, I define the dependent measures in the analysis and conduct a descriptive comparison of these variables across rural, urban, and suburban contexts. Then, I detail the data and methodological strategy for the project.

In Chapter 4, I examine contextual differences in technological capital, parental aspirations, and social capital across rural, suburban and urban places. Though I have described how other scholars employ these concepts to understand variation in the likelihood of college attendance, there is less research available examining how these resources vary within context. While intergenerational closure, peer social capital and parent-child social capital are important for understanding the availability of social connections in each context, these measures of social capital can only partially explain the differences in outcomes like students' college-going aspirations, high school achievement and college attendance to be discussed in subsequent chapters. The inclusion of technological capital in this analysis is an addition to the literature.

In Chapter 5, I investigate the spatial variation in college-going aspirations. In this analysis, I examine how context impacts students' expectations of future education. Much of the existing literature on student-reported aspirations centers on the experience of urban students. Using student-reported college-going aspirations as the dependent measure, I include measures of parental aspirations, technological capital and social capital from the preceding chapter to predict contextual variation in this outcome measure.

In Chapter 6, I explore variation in high school achievement for each of these three spatial contexts. I examine students' tenth grade math scores and test score gains from tenth to

twelfth grade. In this analysis, I include the measures of parental aspirations, technological capital and social capital as well as the students' college-going aspirations as key independent measures.

In Chapter 7, I focus on the spatial variation in college attendance at both two-year and four-year institutions. I analyze the likelihood of attending either a two-year or four-year institution, comparing those who attend post-secondary education with those who choose not to enroll. Then I specify a detailed measure of college enrollment and compare the likelihood of enrolling in a two-year school (compared with non-enrollment) and four-year school (compared with non-enrollment), compared to students who choose not to enroll. In this chapter, I include the measures of parental aspirations, technological and social capital, students' college-going aspirations, and math achievement from earlier chapters as key independent measures. This chapter outlines potential spatial variation in post-secondary enrollment and identifies potential differences in the factors that impact either two-year or four-year enrollment.

In the final chapter of the project, I summarize the main findings of the project and highlight potential contributions to the literature.

**Table 1.1: Public high school graduate and college attendance rates, 1998-2007**

| Year | High School Graduation Rate | Total College Attendance Rate | Four-Year College Attendance Rate | Two-year College Attendance Rate |
|---|---|---|---|---|
| 1998-1999 | 87.7 | 57.4 | 35.4 | 22 |
| | (0.67) | (0.5) | (0.43) | (0.34) |
| 2002-2003 | 85.5 | 61.8 | 35 | 26.7 |
| | (0.77) | (0.94) | (0.61) | (0.58) |
| 2006-2007 | 81.6 | -- | 39.5 | -- |
| | (1.34) | -- | (0.91) | -- |

**Source:** Digest of Education Statistics, Table 211, 2011

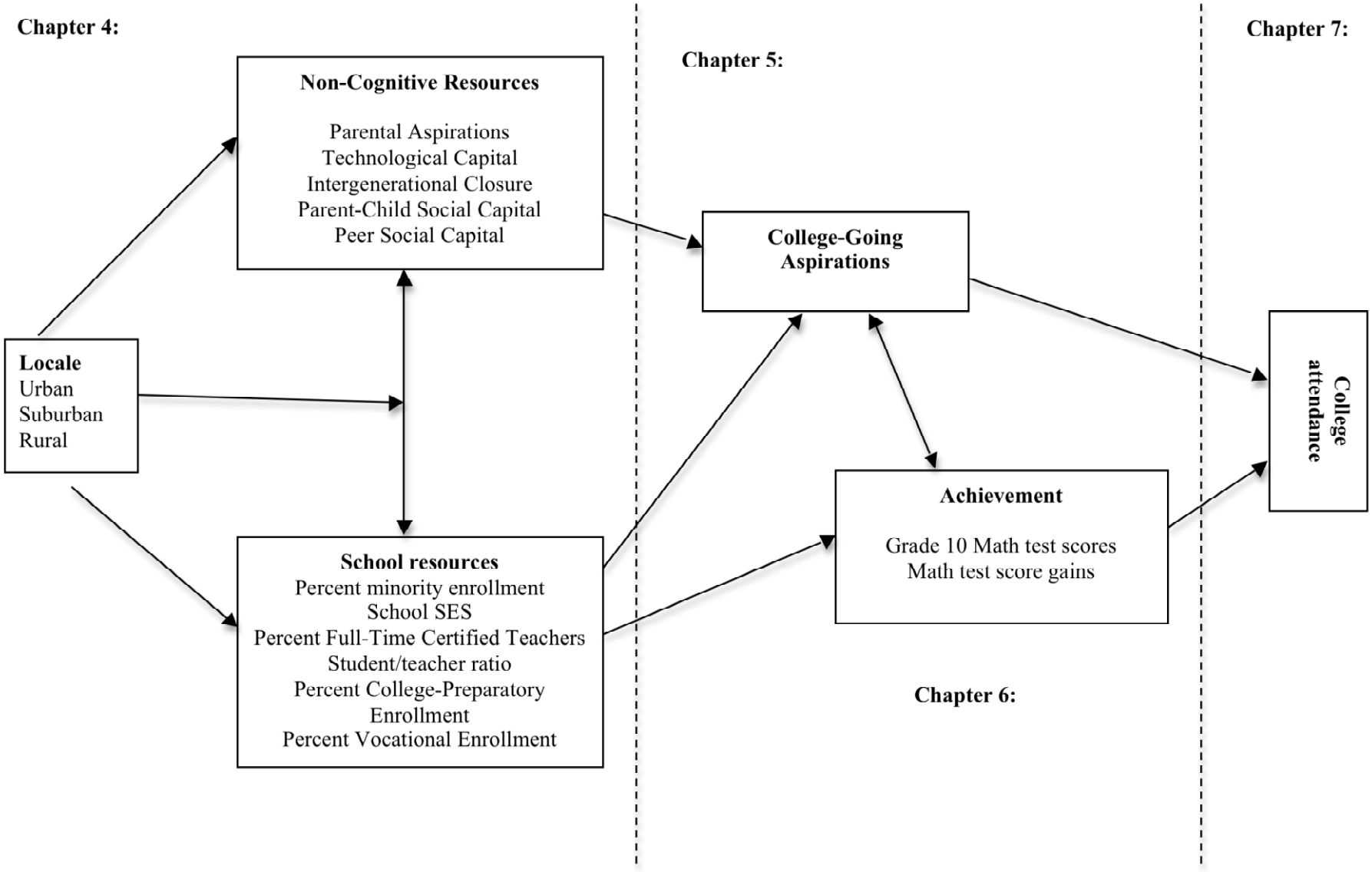
**Table 1.2: Public high school graduate and college attendance rates 2002-2007 by spatial context**

| Year | High School Graduation Rate | Total College Attendance Rate | Four-Year College Attendance Rate | Two-year College Attendance Rate |
|---|---|---|---|---|
| **City** | | | | |
| 2002-2003 | 77.1 | 59.5 | 32.5 | 27 |
| 2006-2007 | 71.6 | -- | 36.1 | -- |
| **Suburb** | | | | |
| 2002-2003 | 83.6 | 67.4 | 40.3 | 27.1 |
| 2006-2007 | 80.8 | -- | 41.2 | -- |
| **Rural** | | | | |
| 2002-2003 | 91.6 | 61.6 | 35.2 | 26.5 |
| 2006-2007 | 86.4 | -- | 41.9 | -- |

**Source:** Digest of Education Statistics, Table 211, 2011

**Note:** Total College Attendance and Two-Year College Attendance rates were not available for each context.

**Figure 1: Visual representation of Analytical Strategy**



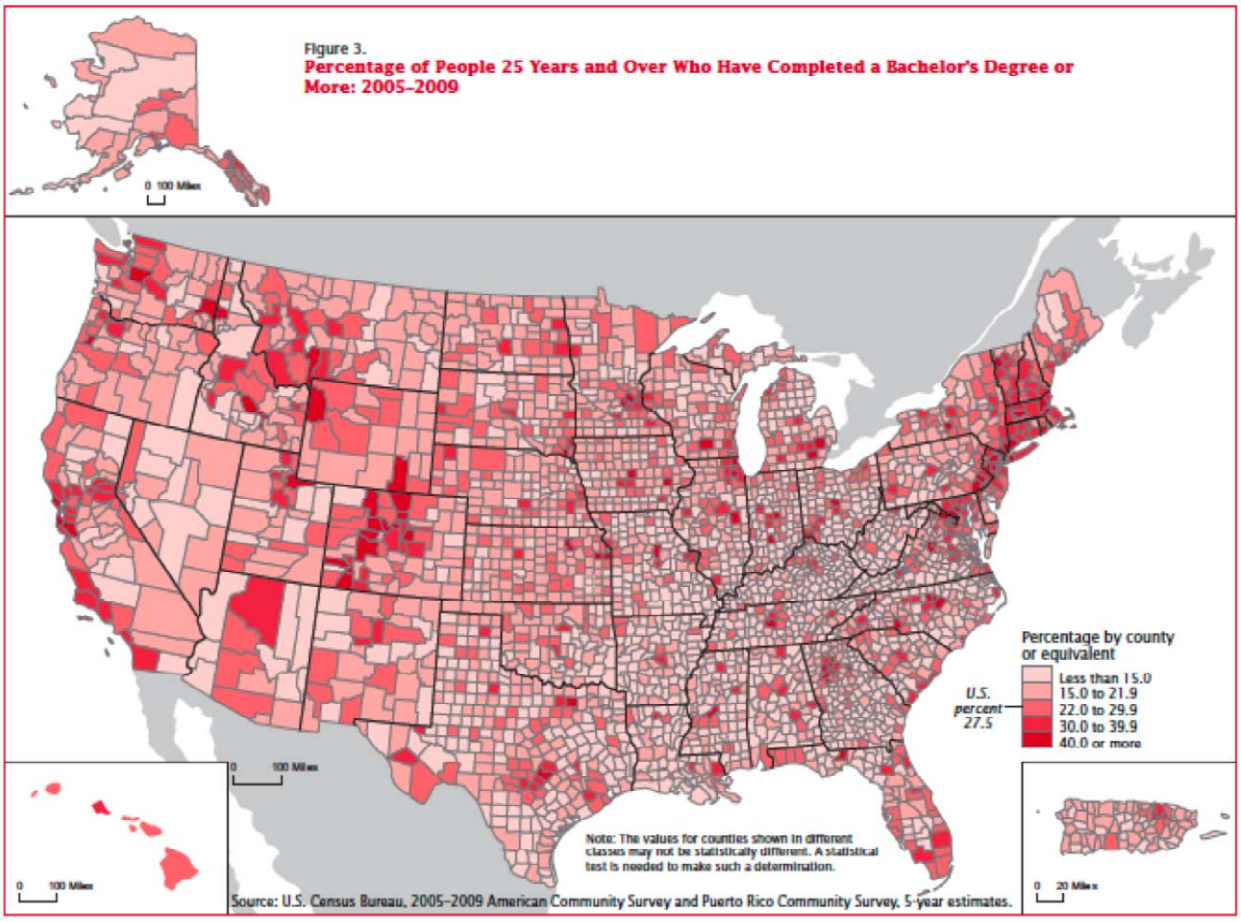



Figure 3.
**Percentage of People 25 Years and Over Who Have Completed a Bachelor's Degree or More: 2005–2009**

# CHAPTER 2: LITERATURE REVIEW

## 2.1 Introduction

Sociologists studying stratification in education broadly focus largely on race/ethnic (Kao and Thompson 2003), class (Hochschild 2003), and gender-based (Buchmann et al. 2008) differences. More recent research on neighborhoods and communities exposes important disadvantages suffered by race/ethnic and class-segregated places (Catsambis and Beveridge 2001; Jencks and Mayer 1990; Owens 2010; Sampson et al. 2002). Much of this neighborhood and community research is concerned with the disadvantages plaguing urban contexts (Anderson 1999; Ludwig 1999; MacLeod 1995; Sampson and Morenoff 2006; Sampson and Raudenbush 1999). While some literature does make comparisons across spatial contexts, sociologists of education studying stratification of school outcomes more often compare urban and non-urban contexts rather than teasing out the differences between urban, suburban, *and* rural places. When research does explore the differences across these three contexts, there is less consensus regarding students' outcomes in each context. The popular discourse implies that suburban students hoard many advantages and that urban and rural students are less advantaged in terms of school and community resources (Rury and Saatcioglu 2011). In addition to the gaps in research concerning spatial context, the literature on college attendance also lacks specificity regarding the relevance of context.

While there is a dearth of literature on higher education produced by and published for education scholars, sociologists of education have paid less attention to higher education. Since 2000, approximately twenty percent of the articles published in the leading journal, *Sociology of Education*, are devoted to higher education and these articles cover a range of issues including rankings (Paxton and Bollen 2003), graduate education (Mullen et al. 2003), and institutional

differences (Alon and Tienda 2005; Brint et al. 2008) among others. Few articles regarding admissions or enrollment appear in this scholarly journal, and in the highest impact sociological journals, scholars devote even less attention with fewer then five percent of articles analyzing facets of higher education. When attention is paid to the subject of higher education, it is typically centered on college preparedness or college access, and sometimes on college life and attainment. Several scholars have written books addressing the admissions process (Espenshade and Radford 2009; Karabel 2005; Stevens 2007) or the stratification of access to higher education along race/ethnic, class or gender lines (Espenshade and Radford 2009; Grigsby 2009; Massey et al. 2003; Mullen 2011). Additionally, some sociologists have taken on the condition of post-secondary education broadly (Arum and Roksa 2010). Few of these books concentrate on spatial stratification or the ways that spatial context could impact students' likelihood of enrolling in higher education. Much of this literature is centered on higher education in the traditional, four-year sense, and in many cases, the focus is on elite institutions (Karabel 2005; Massey et al. 2003). There is an opportunity to add to the literature with this analysis by considering how enrollment in two-year and four-year institutions varies in terms of institutional type and in terms of spatial stratification.

In this chapter, I review the existing literature on college preparedness and college access. The college preparedness literature includes a discussion of the cognitive and noncognitive factors necessary for applying to college. Scholars proxy cognitive ability with measures of academic achievement, but simply studying cognitive ability is not sufficient for understanding school success. Noncognitive abilities and resources are more difficult to capture. These are invisible or intangible resources proven to predict students' success including parental support, possession of social capital, involvement with the extracurriculum, engagement in

problem behavior, fostering of college-going aspirations, and academic achievement. In this literature, scholars often include measures of spatial context to understand how each of these factors could vary for urban, suburban, or rural students. There is a lack of consensus around the impact of spatial context on the factors necessary for pursuit of post-secondary education. The sociological college access literature is thinner than the college preparedness literature. Research on college access centers on the college exploration and application process at traditional four-year institutions. There is limited evidence that the pathways to college could vary for students in different spatial contexts, especially for rural (Carr and Kefalas 2009; McGrath et al. 2001) and urban students (Roderick et al. 2011).

First, I review the literature on college preparedness, paying attention to the noncognitive and cognitive factors related to college attendance. Then I review the existing scholarship on college access. Finally, I discuss two additional explanations for stratification in higher education that are unique to this project, technological capital and physical proximity to institutions. For the purposes of this review, I describe college attendance broadly, recognizing that one major shortcoming of the literature is the lumping together of post-secondary outcomes and considering college attendance in the traditional "four-year" sense. I make contributions to the existing literature by examining spatial variation of these outcomes.

## 2.2 Understanding College Preparedness

Sociologists of education recognize the importance of students' cognitive abilities and their noncognitive resources for predicting variation in students' outcomes (Farkas 2003). Cognitive ability is measured using achievement in various forms, including school grades, grade point averages and standardized test scores. Scholars assume cognitive ability is relatively innate

and not impacted by socialization processes (Farkas 2003). Though measurement of noncognitive resources varies widely, one common dimension of noncognitive resources is that they are intangible and shaped by processes of socialization (Bowles and Gintis 1976). Noncognitive resources help students develop non-academic or noncognitive skills. These are the same skills students develop in their experience with the "hidden curriculum" in schools, including deference to authority, leadership and tenacity (Covay and Carbonaro 2010; Downey et al. 2004). Scholars make this distinction between cognitive and noncognitive resources because in theory, the noncognitive factors are external to students' cognitive ability but related to their educational success. That is, some research has shown that students' noncognitive resources are as important in predicting student outcomes as their achievement has been in previous analyses (Farkas 2003).

The literature explores several factors related to students' preparedness for college. Some factors are purely cognitive like students' academic achievement while others are related to the noncognitive skills that signal college preparedness including involvement in school clubs, and aversion to risky or problem behavior. In this section, I review the literature on factors impacting students' college preparedness. Scholars conceive of college preparedness in several ways including engagement with extracurriculum, maintenance of college-going aspirations, and achievement. For the purposes of this project, I review the relevant literature that guides the methodological strategy described in the following chapter.

*Noncognitive resources: family and school background*

Current research on higher education is rooted heavily in the status attainment framework. The status attainment framework expanded our understanding of social class

relationships by explaining social mobility without relying solely on family income and economic relationships (Blau and Duncan 1967a; Blau and Duncan 1967b; Haller and Portes 1973). Individual social mobility depends largely on one's initial starting point in the social hierarchy. Blau and Duncan (1967) address the relationship between education, occupation and income to explain upward mobility by measuring the impact of parent education and occupation on the occupational choices of children. Even with great social mobility, individuals starting far behind may not catch up to those coming from higher prestige backgrounds. Improvements to the original status attainment framework in the Wisconsin Model extend the Blau-Duncan model of status attainment by including social-psychological factors like students' and significant others' aspirations to predict students' educational outcomes (Sewell et al. 1969). Haller and Portes (1973) compare these two conceptions of status attainment and find that while Blau and Duncan and the Wisconsin Model use differential explanations for how status attainment processes operate, they reach nearly similar conclusions regarding respondents' early and late career occupational prestige. Status attainment models dictate that future social mobility is dependent on individuals' family and social class background as well as individuals' and significant others' aspirations. These studies represented major strides in our understanding of student outcomes at the time, but they fail to account for several other important explanations of student success including structural inequalities.

More recent studies guided by a social reproduction framework reflect strides beyond status attainment models because they recognize the complexities of institutions like families and schools that replicate existing inequality. Educational institutions prove to be crucial in the development, distribution, and reproduction of another noncognitive resource, social capital. Scholars traditionally conceive of social capital as a resource based on social connections and

interactions that convey information, shared norms and expectations (Coleman 1988). Families invest much of their existing economic resources in education for their children, developing social capital in the expectations and supportive relationships they develop with their children. Greater family social capital built between parents and their children is associated with future educational and occupational success (Coleman 1988). Students raised in elite homes with more social capital enjoy rewards based on factors unrelated to their cognitive ability in the school setting because the rules and norms of classroom behavior established in school reflect the expectations of social capital-rich families at home (Dreeben 1968; Farkas 2003). With this uneven accumulation of and distribution of social capital, students suffering deficits in this noncognitive resource may disengage from the rewards of education because schools invest less in them or ignore them (Lareau and Horvat 1999).

Once students engage with public schools, they are subject to other sorting processes that place already privileged students at a further advantage depending on cognitive abilities like their academic preparedness and on other noncognitive dimensions like their behavior, attentiveness, and deference to authority (Bowles and Gintis 1976; Downey et al. 2004). Adaptation to the unwritten norms of school life enables students with greater social capital to engage their cognitive abilities rather than struggle to learn the unspoken expectations or "hidden curriculum" (Dreeben 1968). As such, social capital is an important noncognitive resource associated with high educational outcomes (Crosnoe 2004; DiMaggio 1982; Lareau 1987; Parcel et al. 2010). I examine three forms of social capital in this project: intergenerational closure, parent-child social capital, and peer social capital. These three ways of measuring social capital capture a range of social relationships necessary to keep students engaged with school and the potential pursuit of

higher education. This range of social relationships originates in the family and extends to students' peer social networks.

Intergenerational closure is the quality of relationships between parents in a students' circle of friends. That is, parents with a high degree of intergenerational closure have close relationships with the parents of their children's friends (Coleman 1988). Greater closure in a social network indicates a degree of trust for the social norms and expectations shared across parents and their children. Intergenerational closure is an important predictor of positive student outcomes because closed social networks share information about school life and reinforce norms around positive engagement with school (Ainsworth 2002; Carbonaro 1998; Morgan and Sorensen 1999). Research typically measures intergenerational closure by adding together the number of friends' parents or close personal contacts known to their parents (Ainsworth 2002; Carbonaro 1998). Higher intergenerational closure or broader social networks is positively associated with higher student achievement.

Social capital also exists in parent-child interactions where parents engage with their children by taking trips or outings and by conversing and expressing their hopes for their children (Crosnoe 2004; Sandefur et al. 2006). This parent-child social capital may also be understood as parental engagement in students' lives where parents establish expectations and aspirations for their children by forming and fostering a social relationship with their child (McNeal Jr. 1999b). There is evidence that greater parental involvement is important for students' noncognitive well being (McNeal Jr. 1999b), but consensus regarding how greater parental involvement leads to better student outcomes has not been reached (Hango 2007; Israel et al. 2001; McNeal Jr. 1999b). McNeal's (1999) findings indicate that while parental involvement is related to both cognitive and behavioral outcomes, elite, white students enjoy

extra advantages over their non-white and lower-SES peers. In an analysis of students' grades and standardized test scores, Israel et al. (2001) weigh parental social capital and community social capital, finding that both are positively associated with students' achievement. While Hango (2007) confirms this earlier research showing a positive association between parental involvement and likelihood of high school graduation, she extends this work by adding that the type of involvement and the gender of the involved parent also make a difference for achievement. Each of these studies contributes a nuance to the relationship between parental involvement as social capital and student achievement, and in this project, I build on their scholarship by examining spatial dimensions of these resources.

Even though much of the child's social capital originates in the family, adolescents will also establish social connections with their peers at school. Like the social capital that originates in their families or that originates in closed social networks, peer social capital is akin to relationships described in the peer effects literature where students' affinity to and engagement in school life is bolstered by peers who share positive opinions of education (Buchmann and Dalton 2002; Crosnoe et al. 2003; Hallinan and Williams 1990; Ream and Rumberger 2008). Students are less likely to engage in problem behavior and ultimately drop out of school if they are associating with positively engaged peers or have a positive support system within their school (Hallinan 1983; Haynie 2001). Students exhibiting delinquent behavior are more likely to disengage from school, the rewards of education, and the possibility of applying to college (Matsueda and Anderson 1998; Staff and Kreager 2008).

The limited existing scholarship on spatial stratification of noncognitive resources focuses on social capital. While social capital is higher in some spatial contexts, it does not necessarily follow that all educational outcomes are also better. One benefit of living in rural

places is the strength of familial ties contributing to strong social capital networks (Dyk and Wilson 1999). Using Coleman's (1988) conception of social capital, Dyk and Wilson examine how families help foster social capital networks through their interactions with their children, schools, and other families. These authors emphasize that family social capital alone may not be sufficient for explaining spatial stratification of individual outcomes, especially in rural places where post-secondary aspirations tend to be low.

Other scholars extend Dyk and Wilson's findings that a consideration of both family and community social capital is necessary for understanding how to improve rural student outcomes (Israel et al. 2001; Sandefur et al. 2006). There is conflicting evidence that rural families and schools exhibit explicit support for students as they negotiate graduating from high school and pursuing post-secondary opportunities (Carr and Kefalas 2009; Cobb et al. 1989; McCaul 1989). This spatial stratification of parent-child social capital manifests itself in parents and school administrators holding low post-secondary aspirations for their students (Cobb et al. 1989; McCaul 1989). In a study of students in Maine, Cobb et al. (1989) shows that rural parents and school administrators hold lower post-secondary aspirations for students compared with other urban or suburban parents and administrators. In this way, rural parents may be perceived as less supportive. McCaul's (1989) findings on high school dropouts further support Cobb et al.'s study as he shows rural high school dropouts report receiving less support from their communities and families. More recently, Carr and Kefalas illustrate evidence of less supportive parents and teachers in their ethnography of a rural, Midwestern town. In their analysis, Carr and Kefalas show that parents and teachers would actively *discourage* students labeled less academically competent, failing to support these average students in the college search and application process.

The literature is not clear whether and how spatial context further stratifies the influence of noncognitive resources like family background or the availability of social capital. The availability of broad social capital networks is one factor associated with greater rates of immediate college enrollment after high school graduation. With limited empirical work dedicated to understand the spatial stratification of social capital across rural, urban and suburban contexts, this project stands to contribute to our understanding of college attendance.

*Out of classroom experiences*

Students' college preparedness hinges on experiences inside *and* outside of the traditional classroom. While I will discuss relevant literature regarding the in-class factors like achievement and grades, I also highlight the importance of students' engagement with out-of-classroom activities. Extracurricular involvement strengthens students' ties to school life and is associated with better student outcomes like student grades and the percentage of students meeting state-mandated grade-level achievement expectations (Darling 2005; Stearns and Glennie 2010). The extracurriculum provides a buffer for students who would otherwise engage in risky or delinquent behaviors while in high school (Siennick and Staff 2008). There is limited evidence that the kind of extracurricular participation matters with sports involvement providing an added benefit for some students (Hunt and Hopko 2009). Students engaging with extracurricular activities are also preparing for the college application process, and their involvement helps accumulate social capital associated with greater likelihood of college attendance (Covay and Carbonaro 2010; McNeal Jr. 1999a; Stevens 2007).

The extracurriculum provides students with a reason to stay engaged with school. Darling (2005) shows that student involvement in school-based clubs is related to better student grades

and higher student aspirations. Athletic involvement in rural areas may be a special case, however. Using a small rural-based sample of students, Hunt and Hopko (2009) find a negative relationship between truancy and sports involvement. That is, greater incidences of truancy were common with students not involved in athletics. Using the Early Childhood Longitudinal Study, Covay and Carbonaro (2010) study the non-academic advantages students accrue with involvement in extracurricular activities, and they found that students accrue benefits depending on the type of activity (sports especially). They show that involvement in extracurricular activities may even mediate the relationship between socioeconomic status and achievement. While athletic activities may buffer some students from engaging in behavior that depresses student outcomes, we cannot assume that this process operates in the same way for students in rural, urban, and suburban places. Using Add Health data, Stearns and Glennie (2010) show that extracurricular experiences during high school are positively associated with student outcomes including increased percentage of students performing at grade level and decreased dropout rates. Comparing the extracurricular offerings across urban, suburban, and rural schools, they find a positive relationship between involvement in academic and sports activities and students' achievement. They explain that urban schools offered the greatest array of activities and urban and suburban schools were less likely than rural schools to offer vocationally oriented activities.

Beyond extracurricular activities, outside of the classroom students also engage in activities that are considered "risky" or "delinquent" like use of drugs or alcohol, skipping school or fighting. Greater delinquent or problem behavior is associated with poorer student outcomes (Haynie 2001; Matsueda and Anderson 1998; Siennick and Staff 2008). While I include a measure of peer social capital, this measure captures peers' endorsement of the rewards of education. Using a measure of engagement with problem behavior, I am also able to test

whether students are disengaged with school life. In this way, I am testing the relationship between students' involvement with the school-endorsed extracurriculum as well as their experiences with delinquent behavior. Students engaging in "risky" or delinquent behavior may not have a sense of how poorly they perform in school, placing themselves at a further disadvantage when it comes to the possibility of post-secondary education (Siennick and Staff 2008).

These out-of-classroom factors are used to study achievement but I add to the literature by using them to understand spatial stratification of various factors associated with college-preparedness and ultimately college attendance.

*Educational Aspirations*

In the sociology of education literature, studies of student achievement are more common than studies of aspirations. Measuring aspirations is methodologically tricky because they may change over time (Goyette 2008). It is also possible to foster aspirations related to future opportunities yet know nothing about how to realize these future plans (Rosenbaum 1998). The theoretical and methodological complexities of studying aspirations are evident in the limited literature exploring them. Sociologists studying aspirations are concerned with students' own assessment of their future plans, including post-secondary education, employment or some combination of the two. Status attainment scholars were interested in the ways that both students' and parents' aspirations could predict future plans, and the literature has built on these frameworks as students' college-going aspirations have been on the rise (Buchmann and Dalton 2002; Klasik 2012; Reynolds and Johnson 2011).

Scholars studying students' post-secondary aspirations find that more high school students than ever aspire to attend college (Goyette 2008; Reynolds and Johnson 2011; Reynolds et al. 2006) Rosenbaum 1998. With aspirations on the rise, some scholars wonder whether these aspirations represent true plan for students' post-secondary lives.[1] These inflated aspirations could be associated with a mismatch between students' aspirations and their realistic chances of post-secondary attendance (Klasik 2012; Mickelson 1990; Rosenbaum 1998). Attitudes or aspirations and achievement are often mismatched where students may foster high aspirations but not perform as well academically, limiting their post-secondary prospects (Mickelson 1990). This paradox makes the study of aspirations a challenge for academics.

Among these scholars, there is concern that adolescents have become too ambitious over time (Reynolds et al. 2006). In Figure 2.1, I show how aspirations have evolved over the last forty years. The expectation of a bachelor's degree is mostly constant, but more students than ever aspire to graduate or professional degrees. There is a growing theory that the current culture promoting a "college for all" mentality distorts the difficulty of applying to college while devaluing the post-secondary degree (Collins 2002; Rosenbaum 2001).

Additionally, scholars have shown that simply fostering college-going aspirations may not necessarily translate into greater likelihood of college attendance (Hanson 1994; Klasik 2012). Hanson (1994) explores the concept of "lost talent" where academically competent students adjust their post-secondary aspirations over the course of their high school experience. She finds that students from a lower-SES background are more likely to adjust their expectations of post-secondary education downward as they near high school graduation. Using Educational

[1] This research makes the distinction between aspirations and expectations. Goyette (2008) conceives of "aspirations" as a notional version of the future while "expectations" are a potentially more concrete assessment of future plans.

Longitudinal Study data, Klasik (2012) examines the complex college application process and finds that while high post-secondary aspirations are related to the likelihood of applying to college, they are not the only predictor of post-secondary attendance and they may shift over time. He shows that students expectations of post-education change as they come closer to actually applying to college.

Educational aspirations tend to be stratified along socioeconomic lines (McLelland 1990). One recurrent theme in the existing literature on student aspirations is the prevalence of distrust of higher social classes fostered by working-class individuals (MacLeod 1995; Willis 1977). Students with from high-status backgrounds are more likely to foster high aspirations themselves (McClelland 1990). Students internalize this distrust to such a degree that they may even act against their own self-interest and choose careers that do not advance their social standing (Willis 1977). This rejection of personal advancement is similar to the "acting white" hypothesis where students of color avoid fostering high aspirations and dedicated involvement with school life for fear of being considered in-authentically black (Fordham and Ogbu 1986). In the same vein, working-class students and in many cases, rural students, avoid this burden of "acting middle class" by choosing not to pursue higher education after high school (Carr and Kefalas 2009). Looker and Pineo (1983) emphasize that students' own aspirations are important to study but it is difficult to disentangle students' and parents' post-secondary aspirations related to college attendance. McLelland's (1990) study of students after high school shows that those from a high status have cumulative advantages that snowball over time. More recently, Reynolds and Johnson (2011) examine students' post-secondary aspirations over the last thirty years to see if there is a change in the way background demographic characteristics affect students' aspirations. They find that students' aspirations towards college have not waned but students'

future aspirations may be constrained by local institutional resources. This study leaves an important question unanswered, because though there is a "college for all" mentality in society, it is unclear whether this mentality manifests itself similarly across all spatial contexts. In this project, we situate students' aspirations in spatial context to understand how the "college-for-all" mentality varies spatially and if it impacts ultimate college enrollment.

In terms of the spatial stratification of aspirations, there is also limited scholarship to understand how aspirations might vary by context. MacLeod (1995) and Anderson (1999) connect the urban neighborhood context and depressed aspirations for working class and poor students who aspire towards post-secondary education. In a comparison of urban and non-urban places, Stewart et al. (2007) show that exposure to disadvantaged contexts, in this case to poverty-stricken neighborhoods, is associated with limited post-secondary aspirations. Cobb et al. (1989) find that rural students are less likely to aspire to post-secondary education than their suburban or urban peers. In this study's findings, rural youth valued post-secondary employment opportunities more than their urban and suburban peers, but rural parents were perceived as less supportive of students' future aspirations. In a more recent exploration of rural life, Carr and Kefalas (2009) explore the connection between rural students' limited development of aspirations and rural contexts' depression of student aspirations, especially for those students considered to be less promising academically.

The paucity of research on spatial stratification of aspirations presents a unique opportunity for the present project. I contribute to the existing literature in two ways. First, I spend one analytical chapter predicting differences in students' college-going aspirations. Secondly, I use this same measure of aspirations to explain variation in students' achievement and likelihood of college attendance. While past research has used a measure of student

aspirations as a predictor of other outcomes, few existing analyses seek to understand the spatial variation in students' post-secondary aspirations (Cobb et al. 1989; McCaul 1989).

*High School Achievement*

Students' academic ability and achievement is perhaps the most significant piece of understanding stratification of college attendance. There is widespread consensus regarding factors that promote better overall educational outcomes. Family socioeconomic status (Hochschild 2003; Lareau 2000; Lareau 2003) and family structure (Astone and McLanahan 1991; Sandefur et al. 2006) are important for understanding why educational outcomes vary between students. We also know that residential mobility (Hango 2006; South et al. 2005; South et al. 2007) and resources like social capital (Coleman 1988; Crosnoe 2004; Dunham and Wilson 2007; Sandefur et al. 2006) developed in the family context further enhance students' outcomes. What remains less clear is whether these resources exert the same effect on student achievement in all spatial contexts.

School factors also affect student achievement (Klugman 2012). Past scholarship has shown that the availability of a challenging curriculum in the context of small classes (Lee and Burkam 2003), attentive and engaged teachers (Hallinan 2008), and lower overall enrollment (Lee and Smith 1997) contribute to better high school outcomes for students. Effective teachers and an academically challenging environment are necessary for fostering high outcomes for students (Hallinan 2008). One consistent finding from this research is that school-level resources like the availability of challenging academic classes, experienced teachers and extracurricular activities are all related to higher achievement for rural students (Monk 2007; Stearns and Glennie 2010). Like family networks, these school-level resources matter for creating positive

student outcomes, and the deficits suffered in rural areas have negative consequences for student achievement. (McCaul 1989; Roscigno and Crowley 2001).

The research exploring spatial stratification of achievement has not reached a central conclusion comparing rural and urban student outcomes. Studies of achievement show urban and rural students performing at lower levels than their suburban peers (Roscigno et al. 2006). While there is some evidence that middle school level reading achievement is similar across spatial contexts (Snyder and Dillow 2011), whether rural students outperform urban students in high school remains unclear. Fan and Chen (1999), in their comparison of rural, urban and suburban students using NELS data, show that rural students achieve as well as their urban peers in four different academic subjects. Using state-level data from Kentucky to evaluate the competency of rural schools, Reeves and Byland (2005) also show that rural students' test scores were as good as their peers in small/large towns as well as metro and metro-adjacent areas.

In some cases, rural students underperform when compared with urban students. Using NELS data, Roscigno and Crowley (2001) find that rural students' composite math/reading test scores were lower than their non-rural peers. In their analysis, greater family and school investments were less effective for raising rural student achievement.[2] Rosicgno et al. (2006) confirm that lower achievement based on composite math and reading test scores is associated with living in either a rural or urban place compared to suburban students. These studies confound the impact of spatial context because Roscigno and Crowley (2001) compare rural and non-rural students while Roscigno et al. (2006) compare rural, urban and suburban students. Their analyses highlighted the importance of investment of school resources even after controlling for family resources. School resources mattered more for achievement in both studies

[2] This analysis compared rural students with "non-rural" students. "Non-rural" is a combination of urban and suburban students and provides another confounding issue in the literature.

and resource deficits depressed student outcomes even after controlling for family factors. It is important to note that both of these studies distinguish between family/school "resources" (e.g. demographic measures) and "investments" (cultural capital in families or student/teacher ratio in schools) where typically other scholarship would have included all of these measures as traditional controls.

Only a few of these studies address the variation in the impact of school factors across contexts (Lee and Burkam 2003; Stearns and Glennie 2010).[3] Table 2.1 provides some evidence of the resource disparities between urban, rural and suburban contexts. Though the low student/teacher ratios often associated with better school outcomes may be prevalent in rural places, these teachers tend to be inexperienced and poorly paid (Monk 2007). Even though cost of living between spatial contexts varies considerably, with salaries up to $7,000 lower than their urban colleagues, school administrators are unable to attract and retain the kinds of human resources necessary to enrich rural school settings (Monk 2007; Snyder and Dillow 2011). A shortage of qualified and experienced teachers is one of the reasons rural schools offer far fewer advanced placement courses, shrinking the availability of an academically rigorous curriculum (Snyder and Dillow 2011). According to Table 2.1, there are comparable levels of achievement in the eighth grade across all spatial contexts. The opportunities to enroll in a college-preparatory track are limited in rural places where only half of the schools offer advanced placement opportunities. Subsequently, fewer rural students enroll in these academically rigorous courses, placing them at an additional disadvantage for future post-secondary

[3] These studies vary in the way they incorporate spatial context. Sandefur et al. (2006) includes a measure of region, Lee and Burkam (2003) control for urbanicity and Stearns and Glennie (2010) include a trichotomous measure of urban/suburban/rural.

opportunities.[4] These institutional deficits in terms of basic resources may be related to student outcomes.

In their ethnographic study of education in a rural, Midwestern town, Carr and Kefalas (2009) find support for the relevance of school factors in supporting students' pursuit of higher education. They show a great disparity in attention paid to students based on cognitive ability. That is, Carr and Kefalas find evidence of Lareau's concerted cultivation happening in this rural community, where parents, teachers and school administrators cultivate talents of cognitively high achievers, ignoring average achievers. As Lareau (2003) described in her landmark study of race, class, family life, concerted cultivation is a strategy typically enacted by high-status parents where they cultivate their children's talents, grooming them for future opportunities including the pursuit of higher education. Carr and Kefalas illustrate this process where rural parents and schools invest in only highest achieving students. It may be that family and school investments matter greatly for high achievers in rural areas, but not for less high-achieving students.

The divided consensus over stratification of students' cognitive outcomes presents an opportunity to contribute to the literature. In this project, I am able to analyze spatial differences in student achievement as well as variation in achievement in context.

### 2.3 Understanding College Access

Once students demonstrate their academic competence in high school, they must negotiate the college enrollment process including the search for and application to various post-secondary institutions. Several articles explore the transition process comparing individual

[4] It is unclear whether the low AP enrollment is because of lack of preparation or because of lack of availability due to teacher staffing. In either event, the AP or equivalent level of academic rigor is considered important for preparing academically competent students for college level work.

strategies (Hossler and Gallagher 1987; McDonough 1997) to school involvement (Hill 2008). There is limited evidence examining how the transition process looks different in urban or rural places. Beyond the traditional links between student achievement and college attendance, students' high school curriculum, matters for the pursuit of post-secondary education (Ainsworth and Roscigno 2005; Blau et al. 2004; Engberg and Wolniak 2010). College-preparatory work does not necessarily insure a direct pathway to post-secondary enrollment, but it does signal an expectation of college attendance to students in those classes (Hill 2008). This immediate or near immediate transition is more likely for those engaged in college preparatory work, preventing the disrupted transitions from high school to college that decrease the likelihood of ultimately completing that degree (Bozick and DeLuca 2005; Pallas 1993). Finally, while stratification of access along race/ethnic, gender and social class is well documented (Buchmann et al. 2008; Deil-Amen and Turley 2007; Grodsky and Jackson 2009; Kao and Thompson 2003), few studies recognize that the college application process is grounded contextually in a spatial place.

While student achievement is related to college enrollment, the college application process is both complex and disconnected from the day to day of high school life. The likelihood of college attendance is the result of both students' high school performance and students' negotiation of the college application process. Success with the college application process hinges on students' development of a resume of academic and extracurricular achievements that make each individual applicant marketable to an admissions committee (Stevens 2007). In their seminal essay, Hossler and Gallagher (1987) describe a three-phase model of applying to college where students first foster aspirations in the "predisposition phase" before they ultimately "search" and "choose" in later phases of the process. In each phase, students weigh their own characteristics, their resume of activities, and their school performance before making decisions

about their potential post-secondary options. This model recognizes that the likelihood of attending college depends on many competing factors but it overlooks the potentially complex influence of spatial context. Klasik's (2012) evaluation of the college application process confirms that applying to college involves many steps, building towards actual enrollment, however his study also overlooks the role of spatial context.

The students with the greatest chances of post-secondary enrollment typically attend schools with adequate support for the college search or have supportive parents who understand the college search process (Hill 2008; McDonough 1997). Parent background and parental education are strong predictors of college attendance, but when parents lack the necessary resources to help their student apply to college, school resources become that much more important for transitioning from high school to college. This is evident in some of the existing literature that centers on the process of transitioning from secondary to post-secondary schooling. McDonough's (1997) qualitative account of the college application process in four California high schools, has served as an important foundation for other studies of college enrollment or "college-linking." She shows that increased financial and institutional resources lead to greater attention and support for college-bound seniors. In a comparison of urban and suburban students, Hill (2008) confirms McDonough's findings that both family and school resources positively impact students' likelihood of pursuing post-secondary education as well as actually enrolling in an institution. This scholarship adds considerable depth to our understanding of the admissions and enrollment process while focusing on either individual/family or school characteristics but overlooks the important role of spatial context, leaving rural students out of the analyses altogether. In the analytical section of this project, I include measures of school poverty and student/teacher ratios to assess the impact of school

resources on student outcomes including the likelihood of college attendance.

While post-secondary education has long-term social, health and economic benefits (Card 2001; Kingston et al. 2003), not all post-secondary educations are created equal. The diverse higher education landscape includes traditional four-year institutions, two-year institutions, community colleges, and for-profit institutions, among others. Students may not negotiate this landscape and weigh each of these options equally. Two-year institutions like community colleges traditionally served as a pathway to four-year institutions where students could stay closer to home or spend less money on tuition while preparing for a transition to a four-year institution (Cohen and Brawer 2008; Dougherty 1994). These institutions may offer fields of study unavailable in a traditional liberal arts setting including some vocational training (Belfield and Bailey 2011; Jacobs 2012). Enrolling in a two-year school as a pathway to a four-year institution, while a reasonable strategy for some students, may also be a reason for inflated aspirations (Reynolds et al. 2006). There is evidence that this strategy could result in no earned degree as students who make more transfers across institutions struggle to finish their credential in the end (Goldrick-Rab 2006).

Though two-year institutions theoretically democratize access to higher education, especially for students that are traditionally under-represented in higher education like low-income students, first-generation college students, and students from race/ethnic minority backgrounds, there is some evidence that attendance at community colleges often depresses students' future aspirations (Brint 2003; Clark 1960; Dougherty 1994). Unlike a traditional, residential, four-year setting where students typically focus their attention on their studies and on their extracurricular engagements, students attending a two-year institution may not have the necessary support to be successful in their classes. Students attending a two-year institution may

be balancing responsibilities unrelated to school life and must divide their time between studying and their other obligations. There is also the potential that these students are not as academically prepared for college-level work and require greater remediation than their peers (Reynolds and Johnson 2011). Taking these remedial classes in advance, students amass debt and have the potential to get frustrated with schooling before their true college work begins. Though the strategy to attend a two-year school before transferring to a four-year school is prevalent in our system of higher education, this strategy does not always lead to students earning a bachelor's degree (Brint 2003). One strength of this analysis is the modeling strategy that compares the likelihood of enrollment in either a two-year or four-year institution with non-enrollment to understand variation across spatial contexts.

While scholars consider individual outcomes like the development of aspirations or improvement in achievement as predictors of college attendance, there is less sociological literature on college matriculation rates among rural students or how rural students compare to their peers in other contexts (Deil-Amen and Turley 2007). Earlier I discuss Carr and Kefalas's (2009) findings regarding rural parents and school administrators discouraging less academically inclined students from applying to college. In the case of academic competence or cognitive ability, Carr and Kefalas (2009) describe a strategic deployment of resources to advance the prospects of academically competent students expected to pursue higher education. They invoke Lareau's (2003) concerted cultivation hypothesis to describe the investment of resources and time in individual students whom the entire community considers high achieving.[5] They also show that those rural students receiving preferential treatment regarding college attendance are

[5] Carr and Kefalas's typology of rural students includes "Achievers", "Stayers", "Seekers", and "Returners." The community considered the "Achievers" to show the most promise in terms of future life success, and, as such, invested all of their resources in promoting their chances of making it to college and beyond.

more likely to leave their hometown to pursue a post-secondary degree. Unlike urban educators working to raise collective post-secondary expectations for all students (Farmer-Hinton 2011), many rural teachers and administrators focus on the students who already have the capital resources, providing further advantages for post-secondary enrollment.

Socioeconomic status is an important predictor of student outcomes across the life course, including the likelihood of college attendance. McGrath et al (2001) describe the potential differences in the impact of socioeconomic in rural places. Their study examines a three-part typology of students: professional/managerial parents, agricultural parents and disadvantaged parents. Students of agricultural parents might find themselves more likely to apply to college if their parents engaged with the process like "professional" parents did. Roderick et al.'s (2011) study of urban students' process of college application adds further evidence that these processes are complex and may vary spatially. They show that while urban students may foster high post-secondary aspirations, realizing these dreams is more likely when urban schools foster a culture of achievement and a structure for success in the college application process. These two studies imply that parental socioeconomic status may be crucial for providing certain resources in the home but are not necessarily the only predictor of post-secondary attendance. In both urban and rural contexts, having a supportive adult like a parent or school representative to guide students through the college application process proves beneficial for the high school to college transition. As the availability and impact of these brokers varies across spatial context, it is crucial to analyze how the presence of brokers impacts students' post-secondary pursuits both across spatial contexts and within spatial contexts.

## 2.4 Extending the existing literature

Over the course of the introduction and this chapter, I have highlighted how the literature addresses spatial context. The existing scholarship on stratification of student outcomes favors studies of urban students, and the literature on rural students remains less well developed or often isolated from the larger literature.[6] With little consensus regarding the differences in students' outcomes across spatial contexts, there is an important opportunity to add to our understanding of stratification. Spatial differences, in light of the educational segregation discussed in the first chapter, remain a previously overlooked dimension of segregation. Without dedicating attention to the possibility of spatial differences in student outcomes, we miss important nuances for equalizing educational opportunities across contexts. While rates of college attendance across urban, suburban, and rural places are not equal, there is little scholarly explanation for why this is the case. In the same way neighborhood scholars have examined resource disparities across different neighborhood communities, I show that resource disparities across spatial contexts matter for student outcomes. In this project, I examine stratification of various student outcomes that are known predictors of academic success in college but take a step back in the process to understand how these factors predict variation in the likelihood of even attending college.

There are several ways that the current project contributes to the existing literature. First, this project attempts to link up the sociological literature on college preparedness with the sociological literature on college access. The college preparedness literature indicates that students' cognitive outcomes are important for predicting post-secondary attendance. This literature is concerned with individual and structural factors related to gaining college access, but

[6] In reading the existing literature on rural students, I discovered many of the papers are published in the journal, *Rural Sociology*. Rural scholars have their own conferences and knowledge-sharing opportunities.

it also stops short of understanding how these individual and structural factors predict the type of institution students pursue. Research on college access has shown how a combination of family and school factors is related to pursuing post-secondary education. This literature highlights the college application process and in this project, I consider traditional explanations of access as well as noncognitive resources and out of classroom experiences. Considering the spatial stratification of students' educational outcomes as well as their noncognitive resources expands our understanding of the factors relevant for college application and potential enrollment.

In addition to linking these two literatures, I consider two potential explanations of stratification in higher education: physical distance to nearest institution and access to technology. Spatial isolation and limited technological resources supporting the transition to college may be two of the factors limiting college application and ultimate enrollment. In considering spatial context, I evaluate whether the importance of physical isolation from post-secondary institutions. To date, only one sociological study has addressed the importance of physical distance. In her study of higher education and college applications, Turley (2009) shows that the availability of local colleges increases the likelihood of applying. Greater distance between individuals and nearby post-secondary institutions reduces the likelihood of applying and ultimately enrolling. Even though spatial isolation may present a problem, there is support for the possibility that engagement with school life in rural places may be associated with greater likelihood of college attendance. Petrin et al. (2011) find academically competent rural students are more likely than disengaged students to pursue post-secondary education. Attachment to their hometown increases the likelihood of eventual return home as college-educated citizens.

Students' access to technology remains an important part of understanding stratification in higher education. With the advent of the Internet, students are able to access information and communicate with peers in ways their parents never dreamed would be possible. Access to others and to information expands students' worldview and may serve to increase students' social capital. The literature does not typically include a measure of technological capital to understand stratification of student outcomes, and in this way, the present analysis contributes to earlier research. In the current technological age, access to a computer and the Internet are also relevant to developing forms of capital associated with educational success (DiMaggio et al. 2001; DiMaggio et al. 2004). Additionally, Grodsky and Jackson (2009) emphasize the need to democratize access to information about higher education through access to technology as an important dimension of equalizing opportunities for high school students. While technology is not traditionally considered a measure of capital, in this project, I include a measure of technological capital to understand how technology varies contextually.

Methodologically, studies of spatial stratification tend to control for students' spatial context, making simple comparisons between places. If significant effects of spatial context exist, scholars typically do not examine the way processes work within a spatial context. With increased educational segregation in mind, in this analysis I consider spatial context centrally to understand how the factors associated with college attendance vary depending on their context. In this chapter, I have discussed existing research on students' cognitive and noncognitive resources, showing where there is consensus or disagreement on student achievement in rural, urban or suburban places. In addition to controlling for spatial context, in the next chapter, I describe my analytical strategy where I compare pooled models of all public school students with contextual models of only urban, suburban or rural students. Considering spatial context more

centrally allows for closer examination students' school outcomes and ultimate college enrollment outcomes.

A final contribution of this project is the focus on comparing the likelihood of enrollment at either two-year or four-year institutions. While some articles do consider the difference between two-year and four-year degrees (Alexander et al. 2008; Engberg and Allen 2011; Engberg and Wolniak 2010), and while there is sociological literature on the differences between institutions of higher education (Brint et al. 2008; Stevens et al. 2008), there are still few studies exploring the factors that impact the likelihood of attending a two-year or a four-year institution. Earning a college degree is important for finding a good quality job in a labor market that has inflated the importance of credentials over time (Danziger and Ratner 2010). In this project, I address the factors impacting the likelihood of either two-year or four-year college attendance. In addition to addressing the likelihood of attending college generally, by disaggregating by the type of institution, I show that the college trajectory may vary for students from different individual backgrounds and dissimilar spatial contexts.

As a sociology of higher education literature evolves, it is my hope that spatially focused analyses will contribute to our understanding of student success after high school (Stevens et al. 2008). In the analysis that follows, I examine factors associated with college attendance on their own and as predictors of ultimate college attendance. In this way, I unpack parts of the process of college attendance. I trouble the notion that post-secondary education is a great equalizer and explore spatial stratification as a new dimension of understanding inequality in college preparedness and college access.

**Table 2.1: Comparison of selected school characteristics by context**

| School resources | Student/Teacher Ratio | % offering AP courses[b] | Total enrollment in AP courses[b] | Teacher base salary[c] | 8th grade reading achievement[d] |
|---|---|---|---|---|---|
| City | 15.97 | 77 | 548,400 | 54,880 | 256 |
| Suburb/Urban fringe | 16.10 | 87 | 853,200 | 57,920 | 266 |
| Rural | 14.10 | 50 | 250,600 | 47,600 | 264 |

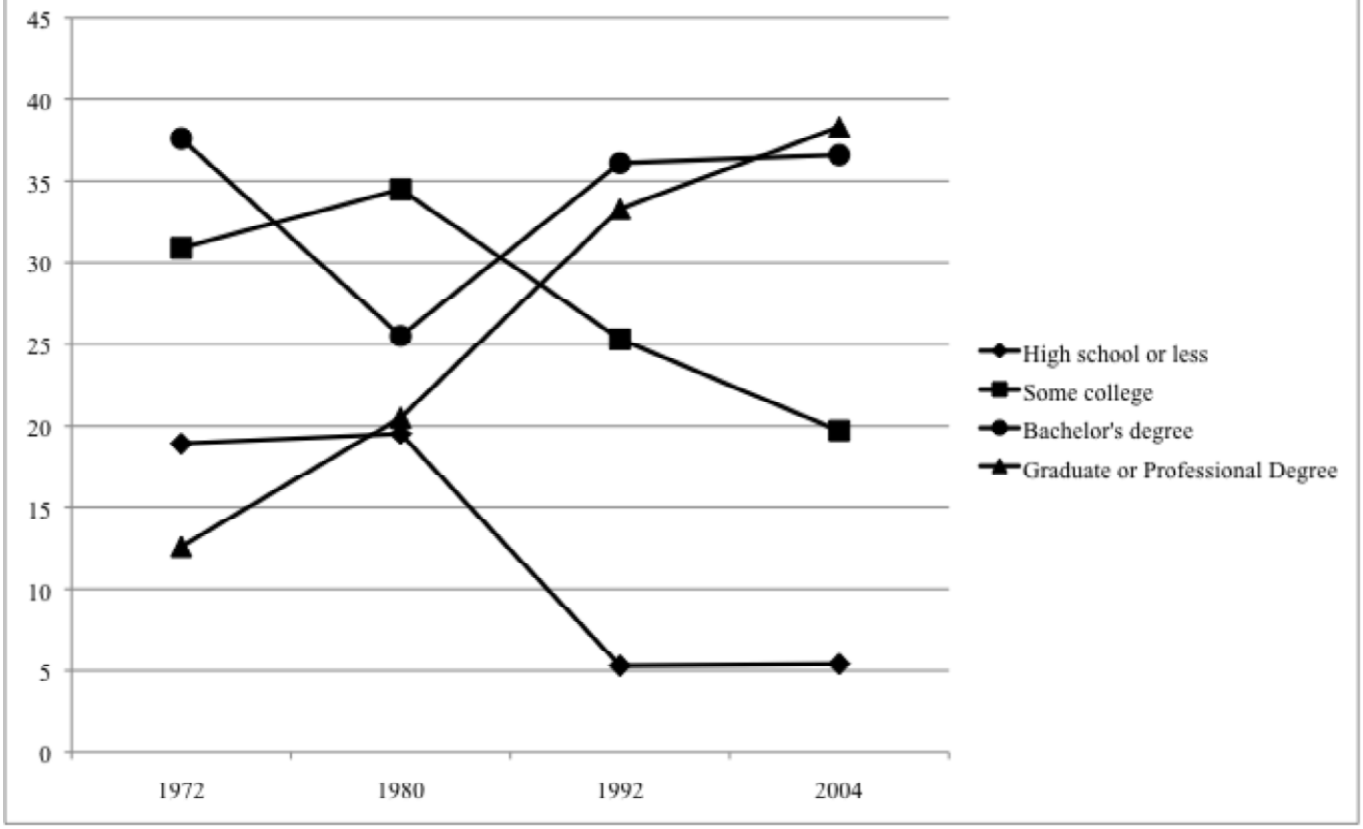
[a] SOURCE: U.S. DOE NCES, Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey," 1988-89 through 2008-09.

[b] SOURCE: U.S. Department of Education (DOE), National Center for Education Statistics (NCES), Fast Response Survey System (FRSS) 85, 2003.

[c] SOURCE: U.S. DOE, NCES, Schools and Staffing Survey (SASS), "Public Teacher Questionnaire" and "Private Teacher Questionnaire," 2007-08.

[d] SOURCE: U.S. DOE, NCES, National Assessment of Educational Progress (NAEP), 2003, 2005, 2007, and 2009 Reading Assessments

**Figure 2.1: Percentage of high school seniors expecting to complete various educational levels : 1972, 1980, 1992, and 2004**



# CHAPTER 3: DATA, MEASURES, AND METHODS

## 3.1 Introduction

In this chapter, I explain the data, measures, and methods employed in the analytical portion of the project. The analytical phase addresses the following four research questions:

1. What are the contextual differences in parental aspirations, technological capital and social capital?

2. What are the contextual differences in the way these noncognitive resources (combined with other factors) affect students' college-going aspirations?

3. What are the contextual differences in the way these noncognitive resources (combined with other factors) and college-going aspirations affect high school math achievement?

4. What are the contextual differences in the way these forms of capital (combined with other factors), students' college-going aspirations and high school math achievement affect two-year and four-year college attendance?

First, I describe the dataset, the *Education Longitudinal Study of 2002* (ELS). Then I detail the dependent and independent variables used in the analysis to link the research questions driving the project to concrete measures. Finally, I specify the methodological strategies employed in each analytical chapter.

## 3.2 Data

The data for this project comes primarily from the *Education Longitudinal Study of 2002* (ELS: 2002). The National Center for Education Statistics (NCES) designed the *ELS: 2002* to track students beginning in the tenth grade through high school graduation and their post-secondary transition to either higher education or employment. The study was designed to understand factors impacting student achievement, persistence through high school and

transitions into the labor market for the same cohort of students over time. This paper employs the restricted version of the data, allowing me to link respondents' information with geocoded data from other sources. The restricted data includes statistics from the Common Core Data (CCD), both maintained by the NCES. The CCD contains descriptive information about public schools, including enrollment, free/reduced-price lunch recipients, and staffing information. In addition to CCD data, I use geocodes to link the ELS to the US Department of Education Database of Post-secondary Institutions for one specific measure I describe later in this chapter.

ELS is a multilevel study incorporating survey responses from school administrators, teachers, librarians, parents, and students, allowing for a comprehensive view of educational life. These data are similar to the widely studied National Education Longitudinal Survey (NELS), combining several viewpoints of schooling into one coherent sample. One benefit of this study is its recent data collection efforts, affording an opportunity to understand student performance in an era of recent education reform. The drawback to the ELS is that, unlike the NELS, the data collection begins in tenth grade and not earlier in students' educational careers.

The NCES collected the ELS in three waves, beginning in 2002 when the respondents were in the tenth grade. In 2002, the NCES first selected schools and then randomly selected students within those schools for the base-year sampling. During the base-year data collection, schools administered cognitive tests in math and reading while also surveying teachers, parents, librarians, and students. The NCES "freshened" the original sample population in 2004 with the addition of approximately 230 students in their senior year of high school who had not participated in the base-year survey. The freshened sample responded to survey questions in 2004 as well. The final collection in 2006 includes students surveyed in both 2002 and 2004.

The data contains responses from 16,190 students drawn from a nationally representative sample of 750 schools. [7]

While this paper is not focused on race/ethnic differences, it is important to note that the NCES oversampled students identifying as Asian or Pacific Islander to insure sufficient sample size for making comparisons with white, black and Hispanic students. Even though the NCES oversampled non-public school students (students in private or parochial settings) to allow for representative comparisons, I restrict the analytical sample to students in public schools. This decision is driven mainly by the limited private school enrollment in rural areas. Additionally, I further constrain the sample of students to schools where at least 5 or more students completed questionnaires in the base-year sampling. The final sample for this analysis contains approximately 12,310 students.

I draw on each wave of data for the dependent measures in this project. The measures of parental aspirations, technological capital and social capital examined in Chapter 4 along with students' college-going aspirations in Chapter 5 and tenth grade math achievement in Chapter 6 come from the base-year data collection in 2002 when students were in the tenth grade. The measure of test score gains in Chapter 6 draws on base-year and first follow-up data collected in the twelfth grade in 2004. The measures of college enrollment in Chapter 7 come from the second follow-up collection in 2006. I will describe each of these measures in greater detail later in this chapter. In addition to using data from each wave of the survey, I use measures from student, parent, and administrator questionnaires and incorporate student transcript data. Key

[7] The restricted data is available for analysis with permission from the National Center for Education Statistics (NCES). As part of the agreement to use these data, all Ns discussed have been rounded to the nearest ten.

independent variables and control measures come from the base year collected when students were in tenth grade.

In order to understand contextual variation in student outcomes, I conduct separate analyses for urban, suburban, and rural students. To make this distinction, I use the NCES designation of spatial context. These designations come from locale codes found in the Common Core Data (CCD) for public schools. The CCD uses a tripartite definition of spatial context depending on the location of the student's school. "Urban" refers to schools located in a large or mid-size central city. "Suburban" refers to schools in a large or small towns or schools located in the urban fringe of a large or mid-size city. "Rural" refers to schools situated in rural or less densely populated areas.

### 3.3 Missing Data

Drawing on each wave of data has benefits and drawbacks. The greatest benefit to including all three waves of data is that the ELS links high school experiences with post-secondary outcomes. In order to account for missing data, I have performed multiple imputations using the MI command in Stata. The MI command estimates several datasets using the variables in the existing data to replace any missing values (StataCorp. 2009). Once the MI data imputations are complete, it is possible to estimate models across all imputed datasets. Using MI estimation commands, Stata presents the coefficients for these estimated models as an aggregate of the coefficients in models estimated across all of the imputed datasets. The benefit of the MI command is that it creates many imputed datasets for the missing data in the sample using the entire group of variables in the original data. This set of commands represents an improvement over the "IMPUTE" command that substituted missing values based on a limited number of

variables in the sample. One drawback of this approach is that the coefficients are not based on specific point estimates and as a result, it is not possible to produce fit statistics like R-squared or Pseudo-R-Squared values. In this chapter and subsequent analytical chapters, I present descriptive statistics using the unimputed data as it is also not possible to calculate descriptive statistics across the imputed datasets in Stata.

I impute the missing data for all measures included in the analysis with the exception of the measures of college attendance. Though I impute missing data for all measures in this analysis, I analyze the unimputed version of the data for each dependent predictor.[8] The analysis builds from one chapter to the next, so in one chapter I analyze the unimputed version of one measure as the dependent outcome and in the next chapter, I include the imputed data for this same measure as an independent predictor. For instance, in the first analytical chapter, I examine a measure of technological capital, and in this analysis, the data for technological capital is unimputed. However, in subsequent analyses, I fully impute missing values for technological capital to use this measure as a predictor of other outcomes. In adopting this strategy, I maximize the number of cases for each set of analytical models.

## 3.4 Measures

### *3.4.1 Dependent measures*

*Parental Aspirations, Technological Capital, and Social Capital*

In Chapter 4, I address the first analytical question: what are the contextual differences in parental aspirations, technological capital and social capital? In this first section of the analysis, I examine five noncognitive resources as dependent measures: *parental aspirations*,

[8] I use the "mi unregister" syntax in Stata to use the raw data form of a dependent measure in each analysis.

*technological capital*, *intergenerational closure*, *parent-child social capital* and *peer social capital*. I describe each of these measures below.

Parental aspirations are an important predictor of student success (Sandefur et al. 2006). Explicit parental support for post-secondary education is an important part of developing high aspirations for students (Lareau 2000; McDonough 1997). For the purpose of this analysis, the parental aspirations measure is a dichotomous variable capturing whether parents aspire for their children to graduate from a four-year institution after high school. The measure compares parents who do have college-going aspirations for their children to those who do not. In Table 3.1, I provide descriptive statistics for the dependent measures. Close to eighty percent of parents of students in the sample have college-going aspirations for their children. Parental aspirations are highest for urban students, followed by suburban and then rural students.

For measures of technological capital and social capital, I follow a similar strategy to create composite measures. First, I conducted exploratory factor analyses to determine how variables would align in a composite measure, and then I used the "alpha" command in Stata to create standardized composite measures. The specific questions for this composite measure and all subsequent measures discussed in this section may be found in Appendix A.

One contribution of this project is the inclusion of technological capital. Technology plays an increasingly important role in school life as resources and knowledge shift to a digital platform (DiMaggio et al. 2004; Gamoran 2001). Technology is also important for pursuit of a post-secondary degree as higher education institutions rely on technology for marketing, recruiting and especially for management of the application process. The *technological capital* variable comes from student responses to two questions about the availability of computers and Internet in the home. I have combined these responses into a standardized composite measure

with an alpha coefficient of 0.789. Higher values indicate greater technological capital. In Table 3.1, I show that on average, the value for technological capital for students in the pooled sample is -0.048. Both suburban and rural students have above average levels of technological capital, while urban students' technological capital lags behind them. Unlike parental aspirations, in this case, students in non-urban contexts are at a greater advantage.

In the analysis of social capital, I examine three measures: *intergenerational closure*, *parent-child social capital*, and *peer social capital*. I detail the specific questions for each measure in Appendix A. The measure of *intergenerational closure* approximates parents' engagement with other parents, and is important for understanding the kind and quality of social network available to families and their children (Carbonaro 1998). This measure combines parents' responses to questions about receiving advice and performing or receiving favors from friends' parents as well as supervising a student's friend on a trip. Using these items, I create a standardized composite measure with an alpha of 0.736. Higher values for this measure indicate greater intergenerational closure. Rural students have the highest average intergenerational closure, higher than the total sample and the mean value for both suburban and urban students.

The second measure of social capital, *parent-child social capital*, approximates the social relationship between parents and their children. Parent-child social capital is necessary to transmit support for students' post-secondary plans. This variable is a composite measure of parents' responses to questions about their engagement with different activities including attending concerts, family events, or sporting events, taking students out to eat or to shop, accompanying students to family events or religious activities, and helping students with homework or hobbies. I combine twelve items into a standardized composite measure with an alpha of 0.819. Higher values for this measure indicate greater parent-child social capital. In

Table 3.1, we see that average parent-child social capital for the entire sample is -0.032.[9] The same advantages in intergenerational closure maintained by rural students are consistent for parent-child social capital. Rural students in this data set have the highest parent-child social capital, followed by suburban and then urban students. Whereas for parental aspirations, rural students were at a disadvantage, in the case of parent-child social capital, these students maintain a significant advantage.

The final measure of social capital in this analysis is *peer social capital*. While others measure social capital based on family or school connections (Crosnoe 2004; Israel et al. 2001; Teachman et al. 1997), some scholars incorporate peer influences as a form of social capital (Crosnoe et al. 2003; Ream and Rumberger 2008). Students increasingly rely on their friends to form and foster post-secondary aspirations, and this portion of the analysis makes an important contribution to the literature to understand how peer connections may vary by spatial context. I construct this measure using student responses to questions about their friends' endorsement of getting good grades, studying and graduating from high school. I combine these measures into a composite measure with an alpha of 0.726. Like the other measures of social capital, higher values for this measure indicate greater peer social capital. For this measure of social capital, in Table 3.1 we see urban students have the highest level at 0.008. Urban students have a greater level of social capital compared with suburban students (-0.027) and rural students (-0.055). Unlike other measures of social capital, in this case, students in rural places are at a disadvantage compared with their non-rural peers regarding peer social capital.

[9] These variables are standardized composite measures. Their means are centered around zero and can be negative.

*College-Going Aspirations*

In Chapter 5, I analyze contextual variation in students' college-going aspirations. To measure educational aspirations, I use data from the base-year survey collected in tenth grade where students report their expected level of education. Students responded to a question regarding how far they expected to go in school. I have recoded their responses into a dichotomous outcome comparing students who plan to graduate from a four-year institution with all others. Approximately 80% of the sample aspires to graduate from college. Approximately the same proportion of students in all three spatial contexts aspires to attend some form of post-secondary education. In the case of post-secondary aspirations, students in non-rural contexts maintain an advantage. These differences are all statistically significant.[10]

*High School Math Achievement*

In Chapter 6, I examine contextual variation in student achievement. In this analysis, I include two measures of student achievement. Drawing on the base-year data, I analyze students' tenth grade math test scores to provide an initial picture of student achievement. I use their twelfth grade math scores to create a measure of test score gains. The decision to examine math test scores is both substantive and pragmatic. Substantively, math ability (as compared to reading ability) is a potentially more objective measure of student achievement as it is less susceptible to bias from outside influences like family or peers (Useem 1992). Pragmatically, the ELS collected both math and reading test scores in the tenth grade but only math scores in the twelfth grade. To assess students' test score gains from tenth to twelfth grades, I am limited to their math achievement where I measure the simple difference in test scores. Like the other

[10] The correlation between students' college-going aspirations and parental aspirations is 0.3661.

dependent measures, the descriptive statistics for tenth grade math achievement and test score gains appear in Table 3.1. Where urban students have had some advantages over suburban and rural students in terms of parental aspirations, social capital or post-secondary aspirations, they have the lowest average tenth grade math scores. Despite low initial test scores, urban students have the second highest test score gains from tenth to twelfth grade. Suburban students have the highest tenth grade math scores and the highest test score gains, maintaining a significant advantage over other contexts. While rural students have the second highest test scores, their low test score gains indicate lagging academic growth from tenth to twelfth grade.

In the analysis of both tenth grade math achievement and test score gains, I limit the pooled sample to students for whom I have both tenth grade and twelfth grade test scores. This insures that I make reliable comparisons across time.

*College Attendance*

In the final analytical chapter, I explore contextual variation in students' likelihood of college attendance using two measures. As discussed in Chapter 2, the pursuit of a post-secondary degree looks very different from person to person. Some students enroll in two-year institutions while others pursue four-year credentials. Others do not choose to pursue post-secondary education and enter the labor market. Drawing on categorical ELS transcript data collected two years after high school graduation, I construct two measures of college attendance. The first measure captures "general" college attendance, comparing students who have enrolled in either a two-year or four-year institution with those who have not chosen to enroll. I contrast this general measure with a more specific measure of college attendance that includes three dimensions. I construct three dichotomous measures of college attendance to analyze whether

students enrolled in either a two-year or a four-year institution or whether students choose not to enroll.[11] Approximately two-thirds of the sample is enrolled in some form of post-secondary education. Over one-third of the sample, 41.4 percent, attends in four-year institutions while 25.8 percent enroll in two-year institutions. About one third of the sample (32.8 percent) has not enrolled in a post-secondary institution. For each spatial context, we see a similar pattern of enrollment with close to two-thirds of students enrolled in some form of higher education. Highest enrollment in four-year institutions is evident for suburban students. For rural students, however, more of this college-going population has enrolled in two-year rather than four-year institutions.

*3.4.2 Key independent measures*

In this section, I include a brief description of several key independent variables in the analysis. The descriptive statistics for these measures appear in Table 3.2.

I include a measure of student engagement with school life and the extracurriculum in all four analytical chapters. Students express their affinity for school life through their compliance with school rules and through their involvement with clubs and athletics (Covay and Carbonaro 2010; Stearns and Glennie 2010). To capture the impact of these factors, I have created three specific measures using student responses to questions from the base-year surveys. The questions included in these measures appear in Appendix B. I measure engagement with *problem behavior* using a standardized composite measure of student responses to questions regarding class attendance and experiences with discipline. I measure *club engagement* and

[11] This measure captures those who matriculate directly after high school graduation and may not effectively capture those who delay enrollment.

*sports engagement* as continuous measures of whether a student reported involvement with multiple student clubs or interscholastic athletic teams. To construct these measures, I add together students' responses to questions regarding their involvement in either school clubs and activities or sports teams. Greater club engagement indicates engagement with multiple club activities. Greater sports engagement indicates involvement with multiple team sports. The specific questions included in each of these measures appear in Appendix B.

Finally, to understand how proximity to an institution is associated with college attendance, in Chapters 5, 6, and 7 I include a measure of *distance to college* in the analysis. This variable measures the distance to the nearest post-secondary institution. There is limited evidence that greater distance to the nearest college or university could be a deterrent to college attendance for geographically isolated students, especially rural students (Turley 2009). The geocoded data on post-secondary institutions comes from the U.S. Department of Education's Database of Accredited Postsecondary Institutions and Programs. This database contains information for accredited institutions of higher education, including two-year and four-year institutions. Using ArcGIS software to assign a latitude and longitude location for the closest either two-year or four-year post-secondary institution, we assigned geocodes for each university in the database. The distance between each student's school and the nearest post-secondary institution was calculated as a point-to-point estimate from the center of the school's zip code to the center of the nearest institution's zip code. Using the geocodes for students' school location, we calculate the distance between respondents' schools and the closest post-secondary institution.[12] The measure included in the analysis is the distance to the nearest post-secondary

[12] These measures have been calculated with gracious support and assistance from the University of Connecticut Map and Geographic Information Center (MAGIC).

institution regardless of institutional type. Therefore, this nearest institution could be a two-year or a four-year institution.

Involvement in extracurricular activities is related to the likelihood of college attendance. Comparing the three spatial contexts, we see rural students exhibit the highest level of engagement with school clubs and athletics. Rural students also exhibit the lowest level of problem behavior compared to their urban and suburban peers. Rural students live at the greatest distance from the nearest post-secondary institution. Urban students have the shortest average distance to travel to the closest college or university at just under two miles. Suburban students have the next nearest distance to travel just under seven miles. Rural students must travel twice the distance that suburban students navigate to get to the closest post-secondary institution. So while, rural students are engaging with the extracurriculum and avoiding problem behaviors, they have further to physically travel to access post-secondary education.

### *3.4.3 Controls*

I include several traditional control measures in the estimated models to understand potential variation based on individual and school characteristics. The data for the individual controls comes from the base-year data collection in 2002. I include measures of *gender* and *race/ethnicity* as reported by students in their survey responses. While the respondents are nearly evenly split by gender, there are differences in the race/ethnic distribution in each context. Urban places have an even distribution of white (25.5%), black (22.8%), Hispanic (22.4%) and Asian (15.2%) students. Suburban students are less diverse than other contexts with over half the suburban respondents identifying as white (52.7%). Eleven percent of suburban students identify as Hispanic, fourteen percent identify as Black, and ten percent identify as Asian. Rural

areas have the least racial/ethnic diversity with close to three-quarters of the respondents identifying as white, nine percent identifying as Hispanic, seven percent identifying as black, and three percent identifying as Asian.

The measure of *socioeconomic status* (SES) comes from a calculation performed by the NCES. This measure combines mother and father's level of education and occupation as well as family income into one composite measure. Urban places have the highest average socioeconomic status, followed by suburban and then rural places. I control for *region* of the country comparing those living in the south with all others. A greater number of the rural respondents hail from the South. To control for the effects of family structure, I include three variables. I compare those students living in a *two-parent/guardian* household with all others, and I include a continuous measure of the *number of siblings* in the household. All three contexts have around the same level of two-parent/guardian households and similar average number of siblings. Finally, I include a measure of *mobility* that compares students who have moved two or more times with peers who have remained in the same location.

To control for school factors, I include six measures of school characteristics using data from both administrator questionnaires and the CCD. The students in this analysis attend public schools, including magnet and charter schools. The *percentage of minority students*, the *percentage of students receiving either free or reduced-price lunch*, and *student/teacher ratio* measures come from the CCD. The *percentage of full-time certified teachers*, the *percentage of students enrolled in a college preparatory track* and *percentage of students enrolled in a vocational track* come from administrator questionnaires. There are some compelling differences in these school factors across spatial context. First, urban schools have on average over two-thirds minority students enrolled compared with 35 percent of suburban enrollment and

21 percent of rural enrollment. The student/teacher ratio is highest in urban schools over 18/1, slightly lower in suburban schools over 17/1 and lowest in rural schools at over 15/1. Over a third of students enrolled in urban schools receive free or reduced-priced meals. Rural schools have the greatest percentage of full-time certified teachers. Suburban and rural schools have a similar percentage of students enrolled in college-preparatory courses and urban schools have a higher enrollment in vocational courses. While this project is not explicitly focused on school effects, I control for the potential effects of unobserved heterogeneity at the school level by using the cluster command in STATA. This command adjusted the standard errors that could otherwise be inflated due to the school-based design of the survey.

**3.5 Methods**

In this section, I discuss the goals for each analytical chapter and the strategy guiding the modeling for the project. I use ordinary least squares (OLS) regression to estimate the models for the continuous measures in Chapter 4 (technological capital and social capital) and Chapter 6 (math test scores and math test score gains). I use logistic regression to estimate models for the dichotomous outcomes in Chapter 4 (parental aspirations) and Chapter 5 (students' college-going aspirations). In Chapter 7, I use multinomial logistic regression in the simultaneous analysis of the likelihood of two-year or four-year college attendance compared to no college enrollment.

In Chapter 4, I address the first of the guiding analytical questions, how parental aspirations, technological capital and social capital vary across spatial contexts. In this chapter, I perform two sets of analyses. First, using a traditional approach to spatial context by including dummy measures for urban and suburban places (rural as reference category), I estimate ordinary least squares (OLS) and logistic regression models for each dependent measure for the pooled

sample of public school students. Most of the sociological literature treats context in this manner, and when there are no statistically significant differences between contexts present, concludes that living in a particular place has little bearing on the outcomes in question. This project goes further to understand how independent predictors may or may not be significantly related to educational outcomes within a specific context. Extending this traditional approach, in a second set of analyses, I disaggregate the data by spatial context and estimate OLS and logit models examining the relationship between individual or school measures and each noncognitive measure.

In the first set of models using the entire sample, I perform a simple set of regressions for each dependent measure, including only dummy variables for urban and suburban context (using rural contexts as the reference category). The general approach to these models may be found in Equation 1 below.[13] The purpose of these simple models is to establish initial differences in individual resources across contexts. In a second model, I add key independent measures including problem behavior, engagement with clubs, and engagement with sports. This model appears in Equation 2 below. In the third model, I control for individual demography to see if any contextual differences are explained by factors other than spatial context. This model appears in Equation 3 below. In the fourth, full model, I control for school characteristics to understand how these factors may impact the dependent measures. The details for this fourth model appear in Equation 4 below. These models help understand if any significant differences in capital resources exist between contexts.

(1) $$y = \alpha + \beta_1(\text{URBAN}) + \beta_2(\text{SUBURBAN}) + e$$

[13] These equations represent the OLS models. The logistic model for parental aspirations follows the same strategy.

(2) $y = \alpha + \beta_1(\text{URBAN}) + \beta_2(\text{SUBURBAN}) + \beta_3(\text{PROBLEM BEHAVIOR}) + \beta_4(\text{CLUBS}) + \beta_5(\text{SPORT}) + e$

(3) $y = \alpha + \beta_1(\text{URBAN}) + \beta_2(\text{SUBURBAN}) + \beta_3(\text{PROBLEM BEHAVIOR}) + \beta_4(\text{CLUBS}) + \beta_5(\text{SPORT}) + \beta_6(\text{FEMALE}) + \beta_7(\text{BLACK}) + \beta_8(\text{HISP}) + \beta_9(\text{ASIAN}) + \beta_{10}(\text{SES}) + \beta_{11}(\text{TWO-PARENT}) + \beta_{12}(\text{SIBLINGS}) + \beta_{13}(\text{MOBILITY}) + \beta_{14}(\text{SOUTH})e$

(4) $y = \alpha + \beta_1(\text{URBAN}) + \beta_2(\text{SUBURBAN}) + \beta_3(\text{PROBLEM BEHAVIOR}) + \beta_4(\text{CLUBS}) + \beta_5(\text{SPORT}) + \beta_6(\text{FEMALE}) + \beta_7(\text{BLACK}) + \beta_8(\text{HISP}) + \beta_9(\text{ASIAN}) + \beta_{10}(\text{SES}) + \beta_{11}(\text{TWO-PARENT}) + \beta_{12}(\text{SIBLINGS}) + \beta_{13}(\text{MOBILITY}) + \beta_{14}(\text{SOUTH}) + \beta_{15}(\%\text{MINORITY}) + \beta_{16}(\text{STUDENT/TEACHER RATIO}) + \beta_{17}(\text{FREE LUNCH}) + \beta_{18}(\%\text{FT CERT}) + \beta_{19}(\%\text{COLLEGE PREP}) + \beta_{20}(\%\text{VOCATIONAL}) + e$

After I examine the full sample, I disaggregate the data and run three models for each of three spatial contexts. The form for these models is detailed in Equations 5, 6 and 7 below. In these models, I explore how the effects of individual and school factors may vary within each context. In the first model, I regress the measures of extracurriculum the noncognitive resources. In the second model, I add individual factors. In the third model, I control for school characteristics.

(5) $y = \alpha + \beta_1(\text{PROBLEM BEHAVIOR}) + \beta_2(\text{CLUBS}) + \beta_3(\text{SPORT}) + e$

(6) $y = \alpha + \beta_1(\text{PROBLEM BEHAVIOR}) + \beta_2(\text{CLUBS}) + \beta_3(\text{SPORT}) + \beta_4(\text{FEMALE}) + \beta_5(\text{BLACK}) + \beta_6(\text{HISP}) + \beta_7(\text{ASIAN}) + \beta_8(\text{SES}) + \beta_9(\text{TWO-PARENT}) + \beta_{10}(\text{SIBLINGS}) + \beta_{11}(\text{MOBILITY}) + \beta_{12}(\text{SOUTH}) + e$

(7) $y = \alpha + \beta_1(\text{PROBLEM BEHAVIOR}) + \beta_2(\text{CLUBS}) + \beta_3(\text{SPORT}) + \beta_4(\text{FEMALE}) + \beta_5(\text{BLACK}) + \beta_6(\text{HISP}) + \beta_7(\text{ASIAN}) + \beta_8(\text{SES}) + \beta_9(\text{TWO-PARENT}) + \beta_{10}(\text{SIBLINGS}) + \beta_{11}(\text{MOBILITY}) + \beta_{12}(\text{SOUTH}) + \beta_{13}(\%\text{MINORITY}) + \beta_{14}(\text{STUDENT/TEACHER RATIO}) + \beta_{15}(\text{FREE LUNCH}) + \beta_{16}(\%\text{FT CERT}) + \beta_{17}(\%\text{COLLEGE PREP}) + \beta_{18}(\%\text{VOCATIONAL}) + e$

I employ a similar approach to the analyses in Chapters 5 and 6, using either OLS or logistic regression modeling. That is, I estimate a set of nested models for the pooled sample of public school students. The first of these models includes only measures of spatial context. The

second model includes measures of extracurricular engagement and noncognitive resources, including technological capital, parental aspirations, three measures of social capital, distance to college, and (in Chapter 6) students' college-going aspirations. The third model adds controls for individual characteristics, and the fourth model controls for school factors. In Table 3.3, I list the approach for Chapter 5 and 6.

While I am concerned with contextual differences in noncognitive resources in Chapter 4, I am also interested in how these measures are related to college-going aspirations and math achievement in subsequent chapters. I include measures of parental aspirations, technological capital, and social capital in my analysis of students' college-going aspirations in Chapter 5. Then, I include the noncognitive measures and student-reported aspirations in my analysis of math achievement in Chapter 6. While one chapter builds upon the next chapter, I resist claims of causality or the use of causal language. The separation of concepts and measures in each analytical chapter helps the reader understand how predictors vary from one context to another. I combine all of the dependent measures as independent predictors in the culminating chapter, Chapter 7, focused on likelihood of college enrollment.

In the final chapter, I use student transcript data to examine the likelihood of college attendance, using two different measures based on type of enrollment. Using the dichotomous measure of college attendance, I estimate logistic regression models to examine variation in college attendance regardless of the type of institution. Then, I develop three measures of college attendance: four-year enrollment, two-year enrollment, and no enrollment to understand contextual differences in college attendance. While each category could be ordered according to time invested towards degree with no enrollment, two-year enrollment and then four-year enrollment as the order, these categories really represent distinct nominal outcomes. Using non-

enrollment as a reference category, I use multinomial logistic modeling to estimate several binary logit models making comparisons between four-year enrollment and non-enrollment and between two-year enrollment and non-enrollment. Multinomial logistic modeling is a departure from the simple modeling in earlier chapters. However, I follow a similar logic as I did in earlier chapters by first estimating models for the entire sample while controlling for spatial context to understand how the predicted probability of attending a particular institution varies across contexts. Then I disaggregate the data, similarly to analyses in earlier chapters, and estimate multinomial logistics models for each context. These contextual models extend the existing literature by examining some of the nuances in predictors that may vary across contexts.

**Table 3.1: Means and Standard Deviations for the dependent measures**

| | Urban | | Suburb | | Rural | | Total | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent measures** | **Mean** | **S.D.** | **Mean** | **S.D.** | **Mean** | **S.D.** | **Mean** | **S.D.** | **Min** | **Max** | **N** |
| ***Chapter 4*** | | | | | | | | | | | |
| Technological Capital | -0.177 [SR] | 1.052 | 0.002 [U] | 0.909 | -0.022 [U] | 0.925 | -0.048 | 0.953 | -2.82 | 0.46 | 8370 |
| Parental Aspirations | 0.781 [SR] | 0.414 | 0.731 [RU] | 0.443 | 0.664 [SU] | 0.472 | 0.728 | 0.445 | 0.00 | 1.00 | 9160 |
| Intergenerational Closure | -0.126 [SR] | 0.728 | -0.037 [U] | 0.737 | -0.003 [U] | 0.740 | -0.050 | 0.737 | -1.15 | 3.07 | 7800 |
| Parent-Child Social Capital | -0.131 [SR] | 0.666 | -0.019 [RU] | 0.564 | 0.038 [SU] | 0.535 | -0.032 | 0.587 | -2.60 | 1.06 | 7920 |
| Peer Social Capital | 0.008 [R] | 0.838 | -0.027 | 0.840 | -0.055 [U] | 0.803 | -0.025 | 0.831 | -3.23 | 1.20 | 6750 |
| ***Chapter 5*** | | | | | | | | | | | |
| Students' college-going aspirations | 0.915 | 0.279 | 0.922 [R] | 0.268 | 0.905 [S] | 0.293 | 0.916 | 0.277 | 0.00 | 1.00 | 8340 |
| ***Chapter 6*** | | | | | | | | | | | |
| Gr. 10 Math scores | 35.192 [SR] | 11.860 | 38.340 [U] | 11.956 | 38.146 [U] | 11.398 | 37.473 | 11.877 | 12.63 | 69.72 | 9820 |
| Test Score gains | 9.875 [S] | 6.846 | 10.306 [RU] | 7.160 | 9.725 [S] | 7.047 | 10.058 | 7.060 | -29.27 | 53.87 | 8300 |
| ***Chapter 7*** | | | | | | | | | | | |
| Four-year enrollment | 0.420 | 0.494 | 0.420 [R] | 0.494 | 0.396 [S] | 0.489 | 0.414 | 0.493 | 0.00 | 1.00 | 9910 |
| Two-year enrollment | 0.245 [SR] | 0.430 | 0.268 [U] | 0.443 | 0.271 [U] | 0.444 | 0.263 | 0.440 | 0.00 | 1.00 | 9910 |
| No enrollment | 0.335 [S] | 0.472 | 0.312 [U] | 0.463 | 0.334 | 0.472 | 0.323 | 0.468 | 0.00 | 1.00 | 9910 |

**Note:** Superscript R–mean is significantly different from mean for rural students at $p < 0.05$.
Superscript U–mean is significantly different from mean for urban students at $p < 0.05$.
Superscript S–mean is significantly different from mean for suburban students at $p < 0.05$.

**Table 3.2: Means and Standard Deviations for the key independent measures and control measures**

| | Urban | | Suburb | | Rural | | Total | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Key Independent Measures** | **Mean** | **S.D.** | **Mean** | **S.D.** | **Mean** | **S.D.** | **Mean** | **S.D.** | **Min** | **Max** | **N** |
| **Extracurriculum** | | | | | | | | | | | |
| Problem Behavior | 0.071 SR | 0.695 | 0.001 RU | 0.632 | -0.047 SU | 0.619 | 0.007 | 0.647 | -0.73 | 6.92 | 9080 |
| Activity Involvement | 0.860 SR | 1.276 | 0.941 RU | 1.286 | 1.092 SU | 1.307 | 0.957 | 1.291 | 0.00 | 9.00 | 8970 |
| Sports Involvement | 0.579 R | 1.173 | 0.625 R | 1.122 | 0.940 SU | 1.286 | 0.688 | 1.184 | 0.00 | 6.00 | 8530 |
| **Distance to nearest college** | | | | | | | | | | | |
| Distance | 1.919 SR | 2.549 | 6.644 RU | 11.503 | 12.148 SU | 10.425 | 6.713 | 10.338 | 0.00 | 173.26 | 9910 |
| **Individual Controls** | | | | | | | | | | | |
| Female | 0.510 | 0.500 | 0.507 | 0.500 | 0.507 | 0.500 | 0.508 | 0.500 | 0.00 | 1.00 | 9910 |
| White | 0.291 SR | 0.454 | 0.547 RU | 0.498 | 0.746 SU | 0.436 | 0.527 | 0.499 | 0.00 | 1.00 | 9910 |
| Black | 0.223 SR | 0.416 | 0.112 RU | 0.315 | 0.086 SU | 0.280 | 0.135 | 0.342 | 0.00 | 1.00 | 9910 |
| Hispanic | 0.227 SR | 0.419 | 0.139 RU | 0.346 | 0.064 SU | 0.245 | 0.144 | 0.351 | 0.00 | 1.00 | 9910 |
| Asian | 0.152 SR | 0.359 | 0.097 RU | 0.296 | 0.027 SU | 0.163 | 0.095 | 0.293 | 0.00 | 1.00 | 9910 |
| Socioeconomic status | -0.159 SR | 0.754 | 0.005 RU | 0.721 | -0.082 SU | 0.653 | -0.058 | 0.717 | -2.11 | 1.80 | 9480 |
| Two-parent | 0.705 SR | 0.456 | 0.776 RU | 0.417 | 0.784 SU | 0.412 | 0.760 | 0.427 | 0.00 | 1.00 | 9540 |
| Number of siblings | 2.621 SR | 1.665 | 2.265 U | 1.508 | 2.288 U | 1.489 | 2.358 | 1.550 | 0.00 | 6.00 | 7840 |
| Mobility | 1.404 SR | 1.531 | 1.209 U | 1.470 | 1.151 U | 1.515 | 1.243 | 1.499 | 0.00 | 5.00 | 7850 |
| South | 0.410 SR | 0.492 | 0.335 U | 0.472 | 0.471 U | 0.499 | 0.386 | 0.487 | 0.00 | 1.00 | 9910 |
| **School Controls** | | | | | | | | | | | |
| Percent Minority | 58.081 SR | 29.045 | 33.525 RU | 30.005 | 20.077 SU | 25.141 | 36.751 | 31.805 | 0.00 | 100.00 | 9910 |
| Student/Teacher ratio | 18.541 SR | 3.662 | 17.524 RU | 3.764 | 15.509 SU | 3.737 | 17.321 | 3.886 | 6.40 | 26.50 | 9560 |
| School Poverty | 30.930 SR | 17.938 | 20.565 RU | 17.712 | 19.323 SU | 14.711 | 22.931 | 17.741 | 0.00 | 96.20 | 8910 |
| % FT Certified Teachers | 94.231 SR | 15.132 | 97.228 RU | 9.073 | 98.271 SU | 8.022 | 96.709 | 10.855 | 2.00 | 100.00 | 9660 |
| % College Prep | 54.717 SR | 33.359 | 56.511 U | 30.345 | 56.779 U | 29.663 | 56.155 | 30.923 | 0.00 | 100.00 | 8210 |
| % Vocational | 21.737 SR | 22.939 | 16.607 RU | 19.885 | 17.987 SU | 20.467 | 18.221 | 20.927 | 0.00 | 100.00 | 7990 |

**Note:** Superscript R–mean is significantly different from mean for rural students at $p < 0.05$.
Superscript U–mean is significantly different from mean for urban students at $p < 0.05$.
Superscript S–mean is significantly different from mean for suburban students at $p < 0.05$.

**Table 3.3: Analytical Strategies for College-Going Aspirations and Math Achievement**

| | **Chapter 5: College-Going Aspirations (Logistic regression)** | **Chapter 6: Math Achievement (OLS Regression)** |
|---|---|---|
| **Model 1** | Urban, Suburban (Rural reference) | Urban, Suburban (Rural reference) |
| **Model 2** | + Problem Behavior, Club Engagement, Sports Engagement, Technological Capital, Parental Aspirations, Parent-Child Social Capital, Peer Social Capital, Distance to nearest college | + Problem Behavior, Club Engagement, Sports Engagement, Technological Capital, Parental Aspirations, Parent-Child Social Capital, Peer Social Capital, Distance to nearest college, **College-going aspirations** |
| **Model 3** | + Female, Hispanic, Black, Asian, Socioeconomic status, South, Two-parent/guardian, Number of siblings, Mobility | + Female, Hispanic, Black, Asian, Socioeconomic status, South, Two-parent/guardian, Number of siblings, Mobility |
| **Model 4** | + Percent minority enrollment, Student/teacher ratio, Percent free/reduced-price lunch recipients, Percent full-time/certified teachers, Percent enrolled in college-preparatory courses, Percent enrolled in vocational/technical courses | + Percent minority enrollment, Student/teacher ratio, Percent free/reduced-price lunch recipients, Percent full-time/certified teachers, Percent enrolled in college-preparatory courses, Percent enrolled in vocational/technical courses |

# CHAPTER 4: SPATIAL STRATIFICATION OF NONCOGNITIVE RESOURCES TECHNOLOGICAL CAPITAL, PARENTAL ASPIRATIONS AND SOCIAL CAPITAL

## 4.1 Introduction

In the previous chapters, I specified the guiding research questions and review the existing literature on college preparedness and college access. After laying the groundwork for the study, I also reviewed the methodology of the present analysis to guide the reader through the next four chapters. In this first analytical chapter, I examine the spatial stratification of noncognitive resources. In order to understand why achievement or college enrollment might vary across spatial contexts, it is important first to consider why these noncognitive resources might vary across spatial contexts.

In order to understand spatial stratification of college attendance, it is important to consider spatial stratification of the resources related to college attendance. This research has shown that students' cognitive ability is important for understanding students' transition from high school to post-secondary education (Deil-Amen and Turley 2007; Klasik 2012). Sociologists of education have scrutinized schools and schooling to understand institutional factors associated with achievement and college attendance (Bourdieu and Passeron 1977). Besides cognitive ability, schools reward student compliance with school norms that reinforce and reproduce elite cultural standards of speech, dress, and behavior among other things. Students' cognitive ability *and* their ability to comply with school norms are both part of school success in our public education system (Bourdieu and Passeron 1977; Bowles and Gintis 1976). Many students begin their schooling with an edge regarding elite school norms and rules because they have been inculcated into this culture by their family or by their community (Astone and McLanahan 1991; Lareau 1987; Lareau 2002; Lareau and Horvat 1999; Sandefur et al. 2006;

Teachman 1987). While student achievement is important, it has been argued that these noncognitive traits are what a student marketable to college admissions committees (Covay and Carbonaro 2010).

While the literature confirms the importance of resources unrelated to cognitive ability like social capital for predicting students' school success (Carbonaro 1998; Crosnoe et al. 2003; Dyk and Wilson 1999; Lareau 1987; Lareau and Horvat 1999; Roscigno and Ainsworth-Darnell 1999), they have not treated context as central in their analyses. So though we understand that family structure, socioeconomic status, race/ethnicity and other individual characteristics may influence students' accumulation of certain capital resources, we have not examined how these relationships vary by spatial context. Specifically, we have not compared these relationships in urban, suburban, *and* rural places. In this chapter, I address this issue by answering the first of four research questions outlined in Chapter 3, *what are the contextual differences in noncognitive resources like technological capital, parental aspirations, and forms of social capital?*

The limited coverage of spatial stratification of different forms of capital leaves a gap in the broader sociology of education literature that I intend to address. I employ an analytical strategy to examine the differences between spatial contexts and the differences within each context regarding these noncognitive resources. Understanding how effects differ across contexts is integral to designing policy and addressing inequality that is grounded contextually in different places. In this chapter, I sort out some of the differences in resources available to students living in different spatial contexts by examining whether and how parental aspirations, technological capital and three measures of social capital vary based on one's spatial context. I want to understand not only how students' resources in urban, suburban, and rural places may differ, but also how the effect of individual attributes may differ within these places.

## 4.2 Measures

In this analysis, I will examine five dependent measures. These include *technological capital*, *parental aspirations*, *intergenerational closure*, *parent-child social capital* and *peer social capital*. All but the measure of parental aspirations are standardized composite combinations of either students' or parents' survey responses. I present descriptive statistics on these measures in Table 4.1. The specific questions for each standardized composite measure appear in Appendix A.

The measure of *parental aspirations* is a dichotomous measure of parents' post-secondary expectations for their students. I have recoded a categorical measure of parents' educational expectations to reflect their desire for their children to pursue post-secondary education and ultimately graduate from college. This measure compares parents who have college-going aspirations for their children with parents who do not have these kinds of aspirations. Parental aspirations are a critical piece of understanding the pursuit of post-secondary opportunities. Without parental support, students may not feel confident enough or knowledgeable enough to negotiate the college application process.

*Technological capital* is a composite measure of students' responses to questions about access to computers and the Internet. This noncognitive resource is important for two specific reasons. First, access to these resources means that students have the opportunity to use and to understand technological applications like word-processing, spread sheeting, and research tools that will help them in their school work. This kind of technological literacy is increasingly important in education and employment, setting these students apart in the classroom and in the labor market (DiMaggio et al. 2004; Gamoran 2001). Additionally, access to these resources enables technologically adept students to also access information of all kinds. The Internet has a

democratizing influence on knowledge, including knowledge of the college application process (Gamoran 2001). Technological capital plays an increasingly important role in school success, as I will show in subsequent chapters. This project is the first to understand how this resource might vary spatially.

The *intergenerational closure* measure approximates the breadth of parents' social network of parent contacts. This standardized composite measure combines parents' responses to the kind and quality of their relationships with other students' parents. These social networks transmit information and also reinforce social norms. Intergenerational closure is important for bolstering student involvement in school, protecting students from engagement in risky behavior, and buffering students and families with a safety net.

The *parent-child social capital* measure proxies the quality of the parent-child relationship, capturing the extent of parent-child interactions. This measure is based on parents' responses to questions about their social relationship with their students including their joint participation in schoolwork, cultural and social activities outside the home, engagement with religious life and with other family members. Greater parent-child social capital is indicative of a stronger, more involved parent-child relationship.

The *peer social capital* measure is a standardized composite measure of respondents' impressions of their peers' engagement with school. Greater peer social capital indicates respondents' peers endorse studying, getting good grades, and graduating from high school.

Turning to Table 4.1, I present descriptive differences in parental aspirations, technological capital and measures of social capital in urban, suburban and rural contexts. While there is some scholarship to support stratification of resources by spatial context (Rury and Saatcioglu 2011), in this sample suburban students did not hoard all of the advantages in terms of

resources. Non-rural (urban and suburban) parents hold high aspirations for their children's post-secondary attainment. This means that not only suburban parents have high aspirations for their children to pursue a college degree. Technological capital is a resource where non-urban students maintain an advantage. Having greater access to information through the Internet means that not only suburban students expand their worldview. Social networks outside of the family, in the form of intergenerational closure, are highest for rural students. Rural students exhibit higher intergenerational closure and parent-child social capital, but non-rural students hold the advantage in terms of peer social capital.

This initial glimpse at the descriptive statistics shows that no one spatial context stands apart from the rest in terms of these crucial noncognitive resources. Moreover, while the literature paints urban and rural contexts at a disadvantage in terms of various resources compared with suburban contexts, these data show that depending on the measure in question either urban or rural places have more in common with suburban contexts than with each other. This chapter explores factors impacting potential differences in these five measures across spatial context.

### 4.3 Methods

The modeling strategy proceeds in two phases. In the first phase, I estimate a series of nested models for each of the five dependent outcomes. In the first set of models (Model 1), for each dependent measure I include only dummy variables for urban and suburban students with rural students used as the reference category. These initial models estimate the differences existing in the relationship between context and the measures in question. In the second set of models, I incorporate for extracurricular engagement and individual characteristics to see if the

effects of spatial context persist once other potential predictors are included in the models. In the final set of models, I control for extracurricular engagement, individual *and* school related factors. For clarity's sake, I present the full, final model for each of the five noncognitive resources in question in Table 4.2 and reserve the incremental models for presentation in Appendices C-E.

In the second phase of the analysis, I estimate three nested models including individual and school predictors for each spatial context. In the first of these models, I include extracurricular engagement variables. In the second model, I add in extracurricular engagement and individual factors. In a final, full model, I combine extracurricular engagement, individual factors, and school factors. For ease of discussion, I present the final full models, one for urban, suburban and rural students for each of the five dependent outcomes.

Because I incorporate these measures of parental aspirations, technological capital and social capital in subsequent chapters as predictors of students' educational outcomes, this chapter provides foundational knowledge about existing contextual differences. The data in these analyses are pooled public school students. I use imputed data for independent variables in this analysis and employ the unimputed version of each dependent variable in its analysis.

## 4.4 Results: Parental Aspirations, Technological Capital and Social Capital

In this section, I discuss the differences in all five dependent variables beginning with the analysis of the pooled public school students in Table 4.2.

*4.4.1 Pooled Analysis of Noncognitive Resources: Technological Capital, Parental Aspirations, and Social Capital*

The literature helps us understand how these noncognitive resources impact various student outcomes. Few analyses take a step further back to understand whether and how these important noncognitive resources vary across groups or contexts. In Table 4.2, I show the various individual and school related characteristics related to variation in parental aspirations, technological capital, parent-child social capital, intergenerational closure, and peer social capital. While in the simplest model regressing the dependent measures and measures of spatial context (see Appendix C), few of these significant differences remain after controlling for other noncognitive factors, individual and school characteristics.

In the final set of models appearing in Table 4.2, I control for individual *and* school related factors. The most notable significant findings in this table in the persistence of spatial variation in parental aspirations and parent-child social capital. Compared with rural parents, urban and suburban parents are forty percent and seventeen percent more likely to foster college-going aspirations, respectively. Urban students still have less parent-child social capital compared with their rural peers. Students' engagement with club activities at their high school is universally positively related to students' noncognitive resources. Greater association with school clubs is positively associated with more technological capital and higher parental aspirations. Among measures of engagement with the extracurriculum, we see that students engaging in delinquent or risky behavior have lower overall noncognitive resources. Engagement in problem behavior takes students away from mainstream academic life and expectations. It makes sense that students engaged in problem behavior may have parents with no post-secondary aspirations. If students show little interest in school, parents may not form

post-secondary aspirations for them. Students with lower intergenerational closure, where their families report fewer social connections with other families to provide supportive norms and expectations around school life, also have less likely to have parents with college-going aspirations. Greater problem behavior is associated with lower parent-child social capital because students are presumably engaging with their peers and not their parents. Students exhibiting this kind of behavior have less peer social capital as well because it is also unlikely that peers engaging in delinquent behavior are simultaneously endorsing the rewards of schooling. Intergenerational closure is greater for students with more school involvement. In essence, students engaged in school are helping their families make connections whether in the audience or on the sidelines. Students with greater involvement in school clubs have greater parent-child social capital because parents are involved in their students' comings and goings. Finally students who join more clubs have higher peer social capital, most likely because they are engaging with like-minded peers who also endorse the rewards of education.

There are some similarities in terms of the effect of individual characteristics for these measures. Female students have greater parental aspirations and more social capital as measured using all three variables. For students from difference race/ethnic groups, the distribution of these noncognitive resources varies. Hispanic and black students have significantly less technological capital compared with their white peers but they have higher parental aspirations, parent-child social capital and peer social capital than their white peers. For Hispanic and black students, when parents are involved with their schooling, they see benefits for their noncognitive resources. Asian students present another confounding picture. Asian students' parents have higher college-going aspirations compared to white peers and they also have higher technological capital. In terms of the social capital resources that depend on parents, Asian

students have less intergenerational closure and parent-child social capital, but Asian students have more peer social capital than their white peers. So it seems that when Asian students are able to build social capital networks with peers, they take advantage of the chance to do so, but their parents make fewer connections with other families that white parents. As such, Asian students see less social capital from measures like these.

Two other individual measures are overwhelmingly important for these noncognitive resources, students' socioeconomic status and their residential mobility. As students' socioeconomic status increases by one unit, their noncognitive resources as measured by all five of these dependent outcomes also increase. Additionally, as students' residential mobility increases, indicating a less stable home life where students move around many times, their noncognitive resources decrease. We know that socioeconomic resources are important for many different student outcomes, but here we see that SES is also a clear and significant predictor of the very noncognitive resources students need to be successful. In the subsequent contextual analysis of these measures, it will important to see if SES is significant in each context as well. Living in a stable home is also important for these noncognitive resources. This makes sense because developing intergenerational closure requires stability to make social connections with others. Frequent moves would disrupt the very social networks families seek to establish with other families and with other students. Frequent moves are related to less parent-child social capital. Frequent moves seem to put on strain on these relationships. Living in a two-parent home is positively associated with technological capital and parent-child social capital. While the benefits of living in a two-parent home are well documented (Astone and McLanahan 1991; McLanahan and Sandefur 1994), having two parents/guardians is associated

with greater access to technological resources and more social time with parents, presumably because having two parents means there are greater resources in terms of time and finances.

Few school characteristics are significantly related to these noncognitive resources. Students enrolled in schools with a high minority enrollment see greater parental aspirations and peer social capital but lower intergenerational closure and parent-child social capital. This means that parents of students attending racially/ethnically-segregated schools have potentially weaker social networks. These parents report less involvement with their children in social activities outside of school as well (Lareau 1987; Lareau 2000). As the percentage of minority enrollment increases, students' parental aspirations are slightly significantly higher. Students attending a school with a higher student/teacher ratio have higher peer social capital, most likely because these students must rely more on their peers than their teachers. Students attending schools with greater school poverty have less technological capital and lower parent-child social capital. Schools with more students receiving free or reduced-price lunch often redirect resources towards students in need rather than towards physical plant or other curricular resources. Students attending schools with more full-time certified teachers have lower peer social capital. In these schools, students may rely on their teachers more and as such have less peer social capital because more teachers are available for support. Peer social capital is marginally higher in schools with a higher student/teacher ratio. This makes sense because in these schools, theoretically teacher attention is divided across more students, forcing students to rely further on their peers for support. Students attending schools with higher college-preparatory enrollment have higher technological capital and higher parental aspirations. Parents of students attending schools with greater college-preparatory enrollment are more likely to foster college-going aspirations for their children. Finally, students attending schools with more vocational/technical

enrollment have lower intergenerational closure. There is research to support tracking patterns where traditionally disadvantaged or low-SES students are more likely to be tracked in vocational technical classes (Crosnoe 2002; Hallinan 1994), which means they would not necessarily be enmeshed in strong social networks established by their parents. These students are more often in families where the parents defer to the school and thereby do not establish the kinds of social networks that would transmit norms or provide support for students as they navigate high school life (Lareau 2000). The percentage of students enrolled in vocational classes could be indication of a less academically rigorous curriculum where both students and their parents are less engaged in the rewards of school life (Kelly and Price 2009).

In the next section, I conduct a contextual analysis of these measures to see how the predictors vary for each context.

### *4.4.2 Contextual Analysis of Noncognitive Resources: Technological Capital, Parental Aspirations, and Social Capital*

In this section, I discuss the results of the contextual analysis for noncognitive resources. I present the contextual models for each dependent outcome in Tables 4.3—4.7. Rather than comparing the result for each spatial context, I compare the models for urban, suburban and rural students for each dependent outcome. Wherever possible, I make comparisons between the dependent measures and also direct the reader to supplementary analyses presented in later appendices for greater clarity about these relationships.

In Table 4.3, I present the contextual analysis of technological capital. Technological capital, while a noncognitive resource, is still a material resource. Having access to a computer or the Internet is related to economic or financial resources. In Table 4.3, we see that access to

technological capital is largely related to demographic characteristics. Students' extracurricular involvement is not significantly related to technological capital with the exception of students' problem behavior in urban and suburban places. Hispanic students in urban and suburban contexts and black students in all three contexts have less technological capital than their white peers. This could be evidence of a persistent digital divide (DiMaggio et al. 2004). Overwhelmingly, as students' socioeconomic status increases, so does their technological capital. The importance of family structure and resources cannot be understated when it comes to this particular noncognitive resource. Students living in two-parent homes in all three contexts also have significantly higher technological capital compared with their peers in single-parent homes. Students in larger families have access to less technological capital as undoubtedly families' financial resources are stretched. This socioeconomic effect extends to school characteristics. School poverty is also overwhelmingly negatively related to technological capital. So students attending schools with fewer resources have less technological capital. In the case of technological capital, there are few differences between the pooled and contextual models. Technological capital is a resource that seems to rely on whether students or families have economic resources.

Parental aspirations represent a different kind of noncognitive resource. I present the contextual analysis of parental aspirations in Table 4.4. I present both the raw logit coefficients as well as odds ratios in this table. Parents of students engaged in problem behavior are at least thirty percent less likely to have college-going aspirations for their children. Regardless of spatial context, parents of students engaged in club activities are over ten percent more likely to have college-going aspirations. Parents of involved students perhaps have higher aspirations because they see their children building a dossier of activities necessary for college applications.

Perhaps these parents see their children as "college material" because they are engaged with school life. Engagement with athletic activities is marginally significant for parents' aspirations in suburban and rural contexts. Parents in all contexts are more likely to have college-going aspirations for female students compared with parents of their male peers. In suburban contexts, parents of Hispanic and black students are fifty-five percent and forty-two percent more likely, respectively, to have college-going aspirations compared with their white peers. In urban and suburban places, parents of Asian students are significantly more likely to have college-going aspirations compared to parents of white peers. As in the analysis of technological capital, here socioeconomic status is significantly related to parental aspirations. As students' socioeconomic status increases, likelihood of parents' college aspirations is close to 70 percent for urban students, over 100 percent for suburban students, and over 115 percent for rural students. Increased residential mobility and greater number of siblings is negatively related to likelihood of parents' college going aspirations in urban contexts.

In this set of models, there are differential effects for the school measures between the pooled and contextual models. In the pooled models, the measure of minority enrollment, student/teacher ratio and proportion of college preparatory enrollment impacted parental aspirations. However, looking spatially, only some of the measures are present for each context. For students in schools with a high minority enrollment, parents are more likely to have college-going aspirations. In urban and rural schools, as the student/teacher ratio increased, so did the likelihood of parents having college-going aspirations. If teachers are overburdened in schools, then parents will have to pick up the slack in terms of support and encouragement. In urban and suburban contexts, parents of students in schools with high college-preparatory enrollment are more likely to have college-going aspirations. The contrary finding is true for students in

schools with higher vocational/technical enrollment. These contextual models provide evidence that the pooled models may obscure important nuances present in each spatial context.

Turning to the three measures of social capital, in Table 4.5, I present the contextual analysis of intergenerational closure. Here the story is quite different compared with parental aspirations. Intergenerational closure approximates the social networks families maintain so for all three spatial contexts, engagement with the extracurriculum is universally significantly and positively related to intergenerational closure. This is one potential avenue for improvement of social capital regardless of context. Parents of students engaged with the extracurriculum are able to connect with other parents and forge relationships while they join other parents in the audience or on the sidelines. Urban students' engagement with problem behavior does not have negative consequences for their intergenerational closure.

The effects of individual characteristics in this contextual analysis of intergenerational closure reflect the pooled results with a few exceptions. Female students have marginally more intergenerational closure, but only in suburban contexts. As in earlier analysis, socioeconomic status continues to be important for students' noncognitive resources. As students' socioeconomic status increases, so does their intergenerational closure. Students' from a higher social class may, theoretically, have parents with greater occupational status and prestige. The subsequent social networks their parents form transmit important social norms around college-going tendencies as well as important information to prepare for the college application process. Students with greater residential mobility have lower intergenerational closure. This is consistent in the literature as it is difficult to maintain the broader social networks if constantly moving or switching schools. As in the last analysis of parental aspirations, the significant school factors in the pooled models are different from the significant school factors in the

contextual models. Though the percent minority enrollment and percent of vocational/technical enrollment were negatively related to intergenerational closure in the pooled results, in these contextual models, we see that these factors matter only in suburban contexts. There is marginally less intergenerational closure in suburban and rural schools with a higher percentage of minority students. As the percentage of students enrolled in vocational classes increases, intergenerational closure decreases in suburban contexts.

In Table 4.6, I present the contextual analysis of parent-child social capital. This second measure of social capital in the analysis, parent-child social capital, captures the kind and quality of parents' social relationships with their children. As in the last analysis, there are some consistent and inconsistent effects between the pooled and contextual models. Unlike the pooled models, not all extracurriculum measures were significant in each context. Students in all three contexts engaging in athletic activities have more parent-child social capital. Urban students' parent-child social capital is positively related to sports engagement. In urban places, perhaps parents and their athletically engaged children have more social interactions. In suburban places, the effects of these measures mirror the pooled results. In rural places, problem behavior is negatively related to parent-child social capital while sports involvement is positively related. Rural and suburban students engaged with problem behavior have lower parent-child social capital. These students may be engaging in risky behaviors and avoiding the watchful eyes of their parents.

In this table we see that female students have more parent-child social capital than their male peers in all three contexts. This implies that parents of female students are engaging in these social relationships more than male students. Hispanic students have higher parent-child social capital compared with their white peers in urban and suburban contexts and black students

have more of this resource in all three contexts when compared with their white peers. This implies that parents of Hispanic and black students in this sample are highly engaged in their students' lives and that there are few differences across contexts. Asian students, however, have lower parent-child social capital in urban and suburban contexts. As in all other analyses, increasing socioeconomic status is associated with greater parent-child social capital. In this case, students in families of high socioeconomic status are developing more parent-child social capital. Students in larger families have lower parent-child social capital have lower parent-child social capital presumably because parent attention in these families is divided. Greater mobility is associated with lower parent-child social capital in all three contexts.

Suburban students living in a two-parent/guardian home enjoy extra advantages in terms of parent-child social capital. These variation in evident in the contextual models and in supplementary models I display in Appendix I. In these supplementary models presented in Appendices F-J, I have created an interaction term for several measures. I create corresponding interaction terms for each spatial context and include them in the supplementary analyses to see which yield significant results. The interaction for the two-parent*suburban term is significant in this analysis.[14]

The final noncognitive measure analyzed here is peer social capital. I present the contextual analysis results in Table 4.7. Students' peer social capital depends largely on their extracurricular involvement and their individual characteristics. As in other analyses, extracurricular engagement is significantly related to peer social capital. Through increased club involvement, students build peer social capital. These club activities help students build the

[14] I show the supplementary analyses for the models in this chapter and in subsequent chapters at the end of the project and comment on significant findings whenever appropriate.

social connections with peers who might also endorse the rewards of education. Because peer social capital measure students' endorsement of studying, making high grades and graduating from high school, it is not surprising that greater problem behavior is negatively associated with this noncognitive resource. These relationships are present for all three spatial contexts and represent one way to keep students engaged in school. Increased engagement with sports is only positively related to peer social capital for suburban students.

As for individual characteristics, female and black students, regardless of their spatial context, have greater peer social capital compared with their male and white peers, respectively. In only suburban contexts, Hispanic students also have greater peer social capital than their white peers. Asian students in urban and suburban contexts report greater social capital when compared with white peers. This finding for Asian students is notable. When social capital depends on parents, Asian students have fewer social capital resources. This is consistent with the analyses of intergenerational closure and parent-child social capital. However, when social capital depends on the student, here in the form of peer social capital, Asian students are at an advantage compared to their white peers.

The results of the school factors confirm the importance of conducting both pooled and contextual analysis. In the pooled models, three school factors, percent of full-time certified teachers, percent of minority enrollment, and the student/teacher ratio, significantly predicted peer social capital. However, in the contextual models, these three factors were not significant predictors in each context. In urban contexts, students in school with more full-time certified teachers have lower peer social capital. In suburban contexts, higher minority enrollment was marginally related to higher peer social capital. And in rural places, higher student/teacher ratios

were also marginally related to more peer social capital. The pooled models masked some of the finer details happening in each context.

### 4.5 Discussion

In this chapter, I examined the variation in parental aspirations, technological capital and social capital resources to lay a foundation for subsequent chapters. While the literature has documented the importance of these resources for academic success, scholars have not addressed spatial context as centrally. These noncognitive resources are important predictors of stratification of school outcomes broadly and for understanding spatial stratification of college attendance specifically. There are several important conclusions I have drawn from the preceding results.

First, in this analysis, I estimate two sets of models to explore how traditional predictors may vary when examined more closely in each spatial context. This approach yielded mixed results. For some noncognitive measures, like technological capital and parental aspirations, the pooled and contextual models reflected one another. That is, the significant effects present in the pooled model were largely present in all three spatial contexts. However, for other noncognitive measures, like intergenerational closure, the pooled and contextual models were not a close match. Additionally, even if the measures of extracurricular engagement or individual characteristics significantly predicted noncognitive resources in the pooled and contextual models, there were some discrepancies for the school characteristics between the two analyses. That is, in the pooled models, if three school characteristics significantly predicted a resource like peer social capital, often in the contextual model, these three characteristics were not significant in each spatial context. In this way, it is possible that pooled models mask nuances of

these relationships in each spatial context, indicating that we cannot assume all characteristics operate the same way for each spatial context. Wherever possible, I have discussed important nuances between the pooled and contextual models by conducting supplementary analyses of the pooled sample using interaction terms. These interaction terms represent the added benefit of context for specific independent predictors measures. In the analysis of parent-child social capital, for example, I was able to show that suburban students in two-parent families enjoyed additionally advantages regarding their parent-child social capital.

Secondly, while the prevailing literature typifies both urban and rural contexts at a disadvantage compared with suburban places, in these analyses, there were few significant effects common to urban and rural places (and not suburban places). These results show that while there are limited similarities across rural and urban contexts, there are more instances of similarities between either urban and suburban places or rural and suburban places. Scholars considering the role of spatial context typically include a comparison between urban and non-urban places (Harding 2003; Roscigno 1999; Sampson and Raudenbush 1999) or rural and non-rural places (Demi et al. 2010; Roscigno and Crowley 2001). These kinds of comparisons obscure the complexity of living in cities, suburbs, or rural locations. For instance, scholars have shown that delinquency is detrimental to student outcomes generally and in this analysis, we also see that engagement with problem behavior further decreases technological capital (one resource necessary for academic success) for urban and suburban students but not rural students. Greater problem behavior was also associated with lower intergenerational closure and parent-child social capital for suburban and rural students but not urban students. Likewise, while school segregation by race/ethnicity has been associated with lower student outcomes, in this analysis, students in schools with high minority enrollment in suburban and rural areas see a slight benefit

for parents' college-going aspirations. Simply controlling for either urbanicity or rurality as in past analyses many not be sufficient for understanding how independent predictors really operate in disparate contexts. These nuances show that each predictor may have its own effects depending on spatial context. As such, these findings call into question contentions that being urban or being rural are so distinctly different from being suburban.

A third important finding is that only one predictor of parental aspirations, technological capital or social capital cuts across all contexts. Socioeconomic status has unilaterally positive effects for students in all contexts in terms of higher parental aspirations and greater technological and social capital resources. This finding confirms existing claims about advantages higher SES students possess and maintain regarding their educational outcomes. In the current economic climate, the popular discourse has focused on preserving resources for middle class families as these families face a tenuous personal and financial/economic future. Students with the fewest socioeconomic advantages face adversity in schools in terms of the explicit and hidden curriculum, and in this chapter, I show low SES students have the least resources that, in theory, help them overcome their existing social class status. When we layer the importance of context, the students with the fewest socioeconomic advantages in the least advantaged spatial context have even greater challenges to overcome in persistence through school before they negotiate the transition to post-secondary opportunities. In subsequent chapters, I see this significant relationship between socioeconomic status and other noncognitive and cognitive measures related to the likelihood of college attendance. If socioeconomic status is related to higher outcomes and greater noncognitive resources, it will be important to think about remedies for inequality outside of schools that impact students' chances of success after high school.

Finally, in this analysis, I see the importance of engagement with school life for building social capital resources. Problem behavior was associated with lowered parental aspirations and lower levels of all three social capital measures. So when students buy into the rewards and resist problem behavior by attending class and meeting the expectations of their teachers, they build social capital resources. Additionally, when they get involved with school activities or with athletic teams, their social capital resources grow. As discussed in earlier chapters, these social capital resources are related to better educational outcomes (Carbonaro 1998; Croninger and Lee 2001; Crosnoe 2004). Carr and Kefalas (2009) go so far as to indict rural communities for their giving up on youth who have disengaged from school life. These results confirm the importance of engagement with school life for enhancing the very resources necessary to improve educational outcomes.

This chapter's results provide a starting point for subsequent analytical chapters. I have shown that controlling for individual and school level characteristics, the greatest difference between spatial contexts is the significance of parent-child social capital. It will important to see if parent-child social capital exerts significant effects on our final dependent measures in question (likelihood of either two-year or four-year college attendance). In the next chapter, I include these measures of parental aspirations, technological capital and social capital as predictors of students' college-going aspirations. While this project is ultimately focused on the spatial stratification of college attendance, dissecting the factors involved in the process sheds light on crucial entry points for future policy and intervention.

**Table 4.1: Means and Standard Deviations for Noncognitive Measures**

| | Urban | | Suburb | | Rural | | |
|---|---|---|---|---|---|---|---|
| **Dependent measures** | **Mean** | **S.D.** | **Mean** | **S.D.** | **Mean** | **S.D.** | **N** |
| Technological Capital | -0.177 $^{SR}$ | 1.052 | 0.002 $^{U}$ | 0.909 | -0.022 $^{U}$ | 0.925 | 10,110 |
| Parental Aspirations | 0.781 $^{SR}$ | 0.414 | 0.731 $^{RU}$ | 0.443 | 0.664 $^{SU}$ | 0.472 | 12,310 |
| Intergenerational Closure | -0.126 $^{SR}$ | 0.728 | -0.037 $^{U}$ | 0.737 | -0.003 $^{U}$ | 0.740 | 9,350 |
| Parent-Child Social Capital | -0.131 $^{SR}$ | 0.666 | -0.019 $^{RU}$ | 0.564 | 0.038 $^{SU}$ | 0.535 | 9,200 |
| Peer Social Capital | 0.008 $^{R}$ | 0.838 | -0.027 | 0.840 | -0.055 $^{U}$ | 0.803 | 8,130 |

**Note:** Superscript R–mean is significantly different from mean for rural students at $p < 0.05$.
Superscript U–mean is significantly different from mean for urban students at $p < 0.05$.
Superscript S–mean is significantly different from mean for suburban students at $p < 0.05$.

**Table 4.2: Pooled Analysis of Noncognitive Measures**

| | Technological Capital[a] | | Parental Aspirations[b] | | | Intergenerational Closure[a] | | Parent-Child Social Capital[a] | | Peer Social Capital[a] | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | S.E. | $\beta$ | $e(\beta)$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. |
| **Spatial Context** | | | | | | | | | | | |
| Urban | 0.027 | 0.035 | 0.385 | 1.470 *** | 0.094 | -0.007 | 0.029 | -0.064 ** | 0.022 | 0.000 | 0.032 |
| Suburban | 0.016 | 0.026 | 0.155 | 1.168 * | 0.070 | 0.011 | 0.022 | -0.014 | 0.016 | -0.001 | 0.026 |
| **Extracurriculum** | | | | | | | | | | | |
| Problem Behavior | -0.084 *** | 0.019 | -0.387 | 0.679 *** | 0.037 | -0.041 ** | 0.012 | -0.046 *** | 0.010 | -0.265 *** | 0.018 |
| Activity Involvement | 0.015 * | 0.007 | 0.175 | 1.191 *** | 0.023 | 0.033 *** | 0.007 | 0.020 *** | 0.005 | 0.062 *** | 0.007 |
| Sports Involvement | 0.011 | 0.010 | 0.075 | 1.078 ** | 0.024 | 0.045 *** | 0.008 | 0.042 *** | 0.006 | 0.022 * | 0.009 |
| **Individual Controls** | | | | | | | | | | | |
| Female | -0.020 | 0.018 | 0.272 | 1.312 *** | 0.051 | 0.030 + | 0.016 | 0.070 *** | 0.012 | 0.186 *** | 0.019 |
| Hispanic | -0.241 *** | 0.039 | 0.259 | 1.296 ** | 0.088 | -0.073 ** | 0.025 | 0.077 *** | 0.020 | 0.119 *** | 0.031 |
| Black | -0.263 *** | 0.039 | 0.235 | 1.265 ** | 0.086 | 0.042 | 0.030 | 0.155 *** | 0.021 | 0.174 *** | 0.034 |
| Asian | 0.116 *** | 0.033 | 1.351 | 3.863 *** | 0.151 | -0.178 *** | 0.029 | -0.334 *** | 0.026 | 0.127 *** | 0.031 |
| Socioeconomic status | 0.316 *** | 0.016 | 0.674 | 1.963 *** | 0.039 | 0.134 *** | 0.012 | 0.192 *** | 0.010 | 0.081 *** | 0.015 |
| South | -0.034 | 0.024 | 0.068 | 1.071 | 0.061 | 0.069 ** | 0.020 | 0.055 *** | 0.014 | 0.038 | 0.026 |
| Two-parent | 0.135 *** | 0.025 | 0.007 | 1.007 | 0.059 | 0.030 | 0.019 | 0.064 *** | 0.016 | 0.023 | 0.022 |
| Number of siblings | -0.045 *** | 0.008 | -0.021 | 0.979 | 0.017 | -0.009 + | 0.005 | -0.023 *** | 0.004 | 0.001 | 0.007 |
| Mobility | -0.017 * | 0.008 | -0.025 | 0.975 | 0.017 | -0.028 *** | 0.005 | -0.013 ** | 0.004 | -0.020 ** | 0.007 |
| **School Controls** | | | | | | | | | | | |
| Percent Minority | 0.000 | 0.001 | 0.010 | 1.010 *** | 0.002 | -0.001 ** | 0.000 | -0.001 ** | 0.000 | 0.001 + | 0.001 |
| Student/Teacher ratio | 0.004 | 0.003 | 0.024 | 1.024 ** | 0.008 | 0.002 | 0.003 | -0.003 | 0.002 | 0.006 * | 0.003 |
| School Poverty | -0.004 *** | 0.001 | -0.004 | 0.996 | 0.002 | 0.001 | 0.001 | 0.001 + | 0.001 | -0.001 | 0.001 |
| % FT Certified Teachers | -0.001 | 0.001 | -0.004 | 0.996 | 0.003 | 0.000 | 0.001 | 0.000 | 0.001 | -0.002 * | 0.001 |
| % College Prep | 0.001 + | 0.000 | 0.004 | 1.004 *** | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| % Vocational | 0.000 | 0.001 | -0.003 | 0.997 | 0.002 | -0.001 ** | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| ***Constant*** | 0.098 | 0.136 | 0.513 | 1.670 | 0.341 | -0.115 | 0.100 | -0.001 | 0.080 | -0.214 + | 0.127 |
| *N* | | 10,110 | | | 12,310 | | 9,200 | | 9,350 | | 8,130 |

**Note:** Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

[a]: OLS Regression Models

[b]: Logistic Regression Models

**Table 4.3: OLS Regression Results for Contextual Analysis of Technological Capital**

| | Urban (*N* = 2,690) | | Suburb (*N* = 5,090) | | Rural (*N* = 2,320) | |
|---|---|---|---|---|---|---|
| | *β* | S.E. | *β* | S.E. | *β* | S.E. |
| **Extracurriculum** | | | | | | |
| Problem Behavior | -0.091 * | 0.037 | -0.110 *** | 0.027 | -0.001 | 0.035 |
| Activity Involvement | 0.017 | 0.017 | 0.008 | 0.009 | 0.022 | 0.015 |
| Sports Involvement | 0.011 | 0.016 | 0.001 | 0.013 | 0.029 | 0.020 |
| **Individual Controls** | | | | | | |
| Female | 0.001 | 0.037 | -0.016 | 0.024 | -0.052 | 0.041 |
| Hispanic | -0.225 ** | 0.064 | -0.310 *** | 0.059 | 0.047 | 0.084 |
| Black | -0.226 ** | 0.067 | -0.270 *** | 0.063 | -0.320 *** | 0.085 |
| Asian | 0.228 *** | 0.059 | 0.053 | 0.043 | 0.041 | 0.112 |
| Socioeconomic status | 0.296 *** | 0.036 | 0.307 *** | 0.022 | 0.377 *** | 0.035 |
| South | -0.050 | 0.050 | -0.026 | 0.033 | -0.027 | 0.049 |
| Two-parent | 0.081 + | 0.048 | 0.160 *** | 0.035 | 0.160 ** | 0.054 |
| Number of siblings | -0.064 *** | 0.015 | -0.039 ** | 0.011 | -0.037 * | 0.014 |
| Mobility | -0.009 | 0.015 | -0.017 + | 0.009 | -0.029 + | 0.016 |
| **School Controls** | | | | | | |
| Percent Minority | 0.000 | 0.001 | -0.001 | 0.001 | 0.001 | 0.001 |
| Student/Teacher ratio | -0.003 | 0.006 | 0.009 * | 0.004 | 0.003 | 0.007 |
| School Poverty | -0.004 + | 0.002 | -0.003 ** | 0.001 | -0.006 ** | 0.002 |
| % FT Certified Teachers | -0.002 | 0.002 | -0.001 | 0.002 | 0.002 | 0.002 |
| % College Prep | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 |
| % Vocational | 0.000 | 0.001 | 0.000 | 0.001 | -0.001 | 0.002 |
| ***Constant*** | 0.321 | 0.259 | 0.047 | 0.193 | -0.191 | 0.231 |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

**Table 4.4: Logistic Regression Results for Contextual Analysis of Parental Aspirations**

| | Urban (*N* = 3,530) | | | Suburb (*N* = 6,050) | | | Rural (*N* = 2,720) | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | $e(\beta)$ | S.E. | $\beta$ | $e(\beta)$ | S.E. | $\beta$ | $e(\beta)$ | S.E. |
| **Extracurriculum** | | | | | | | | | |
| Problem Behavior | -0.334 | 0.716 *** | 0.067 | -0.475 | 0.622 *** | 0.053 | -0.300 | 0.741 *** | 0.072 |
| Activity Involvement | 0.122 | 1.130 ** | 0.045 | 0.175 | 1.192 *** | 0.037 | 0.218 | 1.244 *** | 0.045 |
| Sports Involvement | 0.066 | 1.068 | 0.041 | 0.077 | 1.080 + | 0.041 | 0.089 | 1.093 * | 0.036 |
| **Individual Controls** | | | | | | | | | |
| Female | 0.329 | 1.390 ** | 0.096 | 0.202 | 1.224 ** | 0.073 | 0.378 | 1.459 *** | 0.104 |
| Hispanic | -0.050 | 0.951 | 0.164 | 0.436 | 1.547 *** | 0.124 | 0.186 | 1.205 | 0.190 |
| Black | 0.033 | 1.034 | 0.152 | 0.352 | 1.422 ** | 0.131 | 0.337 | 1.401 + | 0.177 |
| Asian | 1.415 | 4.117 *** | 0.237 | 1.285 | 3.615 *** | 0.200 | 0.814 | 2.257 + | 0.483 |
| Socioeconomic status | 0.519 | 1.681 *** | 0.078 | 0.704 | 2.021 *** | 0.056 | 0.782 | 2.186 *** | 0.080 |
| South | -0.022 | 0.978 | 0.125 | 0.072 | 1.075 | 0.094 | 0.216 | 1.242 * | 0.105 |
| Two-parent | 0.026 | 1.026 | 0.117 | -0.014 | 0.986 | 0.084 | 0.057 | 1.058 | 0.120 |
| Number of siblings | -0.058 | 0.944 + | 0.035 | -0.031 | 0.969 | 0.024 | 0.031 | 1.032 | 0.031 |
| Mobility | -0.083 | 0.920 * | 0.038 | -0.021 | 0.979 | 0.023 | 0.023 | 1.023 | 0.033 |
| **School Controls** | | | | | | | | | |
| Percent Minority | 0.009 | 1.009 ** | 0.003 | 0.010 | 1.010 *** | 0.002 | 0.009 | 1.009 ** | 0.003 |
| Student/Teacher ratio | 0.034 | 1.034 * | 0.016 | 0.012 | 1.012 | 0.013 | 0.037 | 1.038 * | 0.016 |
| School Poverty | 0.001 | 1.001 | 0.005 | -0.005 | 0.995 | 0.003 | -0.009 | 0.991 * | 0.004 |
| % FT Certified Teachers | -0.005 | 0.995 | 0.006 | -0.003 | 0.997 | 0.003 | 0.000 | 1.000 | 0.006 |
| % College Prep | 0.004 | 1.004 * | 0.002 | 0.005 | 1.005 ** | 0.001 | 0.002 | 1.002 | 0.002 |
| % Vocational | 0.001 | 1.001 | 0.003 | -0.006 | 0.994 * | 0.003 | -0.002 | 0.998 | 0.003 |
| ***Constant*** | 0.819 | 2.269 | 0.787 | 0.820 | 2.271 + | 0.435 | -0.287 | 0.750 | 0.695 |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

**Table 4.5: OLS Regression Results for Contextual Analysis of Intergenerational Closure**

| | Urban (*N* = 2,400) | | Suburb (*N* = 4,590) | | Rural (*N* = 2,200) | |
|---|---|---|---|---|---|---|
| | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. |
| **Extracurriculum** | | | | | | |
| Problem Behavior | -0.025 | 0.021 | -0.038 * | 0.017 | -0.074 ** | 0.026 |
| Activity Involvement | 0.031 * | 0.014 | 0.036 *** | 0.010 | 0.030 * | 0.015 |
| Sports Involvement | 0.028 * | 0.012 | 0.053 *** | 0.012 | 0.051 ** | 0.016 |
| **Individual Controls** | | | | | | |
| Female | 0.042 | 0.030 | 0.042 + | 0.023 | -0.010 | 0.032 |
| Hispanic | -0.058 | 0.044 | -0.099 ** | 0.034 | -0.043 | 0.076 |
| Black | 0.037 | 0.049 | 0.059 | 0.042 | 0.022 | 0.080 |
| Asian | -0.156 *** | 0.044 | -0.209 *** | 0.042 | -0.064 | 0.111 |
| Socioeconomic status | 0.121 *** | 0.022 | 0.132 *** | 0.017 | 0.160 *** | 0.027 |
| South | 0.113 ** | 0.042 | 0.063 * | 0.028 | 0.032 | 0.045 |
| Two-parent | 0.033 | 0.033 | 0.040 | 0.027 | -0.011 | 0.043 |
| Number of siblings | -0.001 | 0.010 | -0.011 | 0.007 | -0.019 + | 0.011 |
| Mobility | -0.031 ** | 0.009 | -0.028 *** | 0.007 | -0.022 * | 0.011 |
| **School Controls** | | | | | | |
| Percent Minority | -0.001 | 0.001 | -0.001 + | 0.001 | -0.002 + | 0.001 |
| Student/Teacher ratio | 0.000 | 0.005 | 0.005 | 0.003 | 0.000 | 0.005 |
| School Poverty | 0.001 | 0.002 | 0.002 | 0.001 | 0.002 | 0.002 |
| % FT Certified Teachers | 0.000 | 0.001 | 0.000 | 0.001 | -0.001 | 0.002 |
| % College Prep | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 |
| % Vocational | -0.001 | 0.001 | -0.001 * | 0.001 | -0.001 | 0.001 |
| ***Constant*** | -0.144 | 0.179 | -0.148 | 0.165 | 0.089 | 0.209 |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

**Table 4.6: OLS Regression Results for Contextual Analysis of Parent-Child Social Capital**

| | Urban (*N* = 2,460) | | Suburb (*N* = 4,660) | | Rural (*N* = 2,230) | |
|---|---|---|---|---|---|---|
| | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. |
| **Extracurriculum** | | | | | | |
| Problem Behavior | -0.029 | 0.017 | -0.049 ** | 0.015 | -0.069 ** | 0.019 |
| Activity Involvement | 0.017 | 0.010 | 0.027 *** | 0.006 | 0.013 | 0.009 |
| Sports Involvement | 0.038 ** | 0.011 | 0.042 *** | 0.009 | 0.047 *** | 0.010 |
| **Individual Controls** | | | | | | |
| Female | 0.097 *** | 0.025 | 0.071 *** | 0.017 | 0.041 + | 0.024 |
| Hispanic | 0.148 *** | 0.037 | 0.071 * | 0.028 | -0.033 | 0.056 |
| Black | 0.223 *** | 0.038 | 0.113 *** | 0.030 | 0.137 ** | 0.046 |
| Asian | -0.337 *** | 0.049 | -0.319 *** | 0.035 | -0.109 | 0.088 |
| Socioeconomic status | 0.236 *** | 0.020 | 0.169 *** | 0.015 | 0.188 *** | 0.020 |
| South | 0.051 + | 0.030 | 0.066 ** | 0.020 | 0.016 | 0.025 |
| Two-parent | 0.057 + | 0.033 | 0.088 *** | 0.023 | 0.016 | 0.029 |
| Number of siblings | -0.026 ** | 0.008 | -0.018 ** | 0.006 | -0.027 ** | 0.007 |
| Mobility | -0.009 | 0.008 | -0.012 * | 0.005 | -0.018 * | 0.008 |
| **School Controls** | | | | | | |
| Percent Minority | -0.001 | 0.001 | -0.002 ** | 0.000 | 0.000 | 0.001 |
| Student/Teacher ratio | -0.006 | 0.004 | -0.001 | 0.003 | -0.006 | 0.004 |
| School Poverty | 0.000 | 0.001 | 0.002 * | 0.001 | 0.000 | 0.001 |
| % FT Certified Teachers | -0.001 | 0.001 | 0.000 | 0.001 | 0.003 ** | 0.001 |
| % College Prep | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |
| % Vocational | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| ***Constant*** | 0.084 | 0.176 | -0.100 | 0.097 | -0.158 | 0.115 |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

**Table 4.7: OLS Regression Results for Contextual Analysis of Peer Social Capital**

| | Urban (*N* = 2,110) | | Suburb (*N* = 4,190) | | Rural (*N* = 1,820) | |
|---|---|---|---|---|---|---|
| | *β* | S.E. | *β* | S.E. | *β* | S.E. |
| **Extracurriculum** | | | | | | |
| Problem Behavior | -0.199 *** | 0.029 | -0.311 *** | 0.024 | -0.269 *** | 0.046 |
| Activity Involvement | 0.043 ** | 0.016 | 0.078 *** | 0.010 | 0.050 ** | 0.014 |
| Sports Involvement | 0.008 | 0.013 | 0.032 + | 0.016 | 0.028 | 0.018 |
| **Individual Controls** | | | | | | |
| Female | 0.182 *** | 0.037 | 0.188 *** | 0.027 | 0.184 *** | 0.037 |
| Hispanic | 0.080 | 0.061 | 0.151 *** | 0.042 | 0.087 | 0.076 |
| Black | 0.164 ** | 0.062 | 0.148 ** | 0.049 | 0.209 * | 0.079 |
| Asian | 0.132 * | 0.059 | 0.125 ** | 0.042 | 0.121 | 0.111 |
| Socioeconomic status | 0.059 * | 0.028 | 0.093 *** | 0.020 | 0.060 + | 0.035 |
| South | 0.145 ** | 0.051 | -0.041 | 0.038 | 0.066 | 0.043 |
| Two-parent | -0.008 | 0.041 | 0.028 | 0.031 | 0.054 | 0.047 |
| Number of siblings | -0.004 | 0.013 | 0.009 | 0.010 | -0.008 | 0.016 |
| Mobility | -0.026 + | 0.014 | -0.018 | 0.011 | -0.016 | 0.014 |
| **School Controls** | | | | | | |
| Percent Minority | 0.000 | 0.001 | 0.001 + | 0.001 | 0.000 | 0.001 |
| Student/Teacher ratio | 0.002 | 0.006 | 0.005 | 0.004 | 0.011 + | 0.007 |
| School Poverty | -0.001 | 0.002 | -0.001 | 0.001 | 0.001 | 0.002 |
| % FT Certified Teachers | -0.003 ** | 0.001 | -0.002 | 0.001 | -0.002 | 0.001 |
| % College Prep | 0.001 | 0.001 | 0.000 | 0.001 | 0.001 | 0.001 |
| % Vocational | 0.000 | 0.001 | 0.001 | 0.001 | 0.000 | 0.001 |
| ***Constant*** | -0.002 | 0.207 | -0.228 | 0.178 | -0.367 + | 0.193 |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

# CHAPTER 5: STUDENTS' COLLEGE-GOING ASPIRATIONS

## 5.1 Introduction

In this chapter, I explore one factor associated with the likelihood of college attendance, students' college-going aspirations. Developing and fostering high educational and occupational aspirations is important to keep students engaged in the rewards of public education. Getting the idea to attend college or pursue post-secondary training in some form does not happen overnight. Students who do develop post-secondary aspirations may not fully understand what is required of them to realize these plans. We know from the literature that students growing up in households with college-educated parents may take this process of developing aspirations for granted (Johnson 2006). It was always expected that they would go to college, so they apply and enroll. The literature has not fully addressed how context impacts this process of applying to and enrolling in higher education in its various forms. Nor do we understand if other traditional factors have the same effects when we examine urban, suburban, and rural places separately. In this chapter, I conducted an analysis of college-going aspirations to understand the factors impacting this measure for the entire sample of students and for the spatial subgroups. This analysis builds on the previous chapter where I examined measures of technological capital, parental aspirations and social capital to assess how these noncognitive resources vary by context.

In the last chapter, I show that no one spatial context maintains an advantage in terms of technological capital, parental aspirations, or social capital. In fact, counter to other scholarship that equates city and rural living, I explain that urban and rural places look more like suburban places (depending on the outcomes in question) than they do each other. I also show that

socioeconomic status has significant effects on the level of these noncognitive resources regardless of context. Finally, I show that engagement with school life is important for predicting levels of social capital. I illustrate how these noncognitive resources are nuanced depending on the spatial context, and in this and future analytical chapters, these measures serve as predictors of the likelihood of college attendance. In this chapter, I include technological capital, parental aspirations and social capital measures to understand how students' post-secondary aspirations vary across contexts. I address the second research question outlined in Chapter 3, *what are the contextual differences in the way these noncognitive resources (combined with other factors) affect students' college-going aspirations?*

Scholars studying higher education have documented a marked increase in the prevalence of college-going aspirations among high school seniors (Rosenbaum 2001). Even though more students aspire to higher education in some form, not all students are able to manage the transition from high school to college. This stunted transition is due to several factors. Students without the necessary familial support or economic resources adjust their aspirations as they get closer to high school graduation when they learn more about the concrete process of applying to college (Hanson 1994). Additionally, schools are not equipped to support students' college search and selection process (Hill 2008; McDonough 1997). The college application process itself consists of many steps that take place over time, and while fostering college-going aspirations is part of this process, it is not the only factor that affects the likelihood of college attendance (Klasik 2012). Few studies situate the nuances of this process in urban, suburban, *and* rural spatial contexts.

The literature typically treats college-going aspirations as part of the college-preparedness process (Deil-Amen and Turley 2007; Grodsky and Jackson 2009). Scholars

studying college expectations have shown that parents' education and occupation are strongly related to students' aspirations (MacLeod 1995; McDonough 1997; Sandefur et al. 2006). The earliest research considered fostering college-aspirations to be part of the status attainment process (Sewell and Hauser 1972) and later research considered aspirations in the context of local culture (MacLeod 1995; Willis 1977). Aspirations, when formed early, become ingrained in students' expectations of post-secondary experiences (Trusty 2000). Scholars have identified a potential gap between some students' post-secondary expectations and their actual academic achievement (Mickelson 1990), such that low-achieving students continue to aspire to post-secondary education even if their school performance is not indicative of students otherwise ready to apply or to enroll in college. This attitude-achievement paradox continues to trouble scholars studying differences in stratification of student outcomes, and in many ways remains unanswered in the literature. In this chapter, I examine how spatial context may stratify college-going aspirations, and in the final analytical chapter, I compare students' earlier aspirations with their actual enrollment decisions. I observe a marked gap between students' aspirations and their ultimate enrollment decisions in the data that lends further support to Mickelson's hypothesis.

In this way, the current analysis adds to the literature in three ways. First, it considers factors beyond individual demography that could influence students' college-going aspirations. In the last chapter, I examined noncognitive resources like technological capital, parental aspirations, and three measures of social capital, and in this chapter, these measures serve as predictors of students' college-going aspirations. In a sense, I use noncognitive resources to predict further variation in another noncognitive resource. Technological capital expands students' worldview beyond their local circumstances, lending a potential boost to students' aspirations (Grodsky and Jackson 2009). The literature leads us to believe that parental

aspirations are crucial for understanding the differences in students' college-going aspirations. When students have the explicit support of their parents, they may begin to form post-secondary aspirations of their own. The measures of social capital are also essential for understanding students' college-going aspirations. Intergenerational closure, the closed social network formed by students' parents, serves to transmit information about the value of post-secondary education and the application process. Parent-child social capital proxies the social relationship between parents and children, measuring if students are able to discuss their post-secondary plans with their parents. And peer social capital is increasingly relevant to this discussion, because as peers endorse rewards to education, students may be able to form and foster higher post-secondary aspirations. I include these measures as predictors in this and subsequent analytical chapters of this dissertation project.

Second, I introduce a new predictor of student outcomes, the distance to nearest college or university. Physical proximity increases students' exposure to higher education and thus far is seldom considered when examining college-going aspirations. Without post-secondary institutions nearby, it is difficult for students to physically see themselves in the context of higher education. In the same way that neighborhood scholars argue the importance of college-educated role models in otherwise disadvantaged communities for promoting achievement, I contend that physical proximity is relevant to our understanding of college-going aspirations and outcomes related to college attendance.

Third, I consider spatial context more closely than simply controlling for urbanicity. Some scholars have explored aspirations broadly (McClelland 1990; Reynolds and Johnson 2011; Reynolds et al. 2006; Rosenbaum 2001). Others control for or focus solely on urbanicity in their studies of aspirations (Blau et al. 2004; Looker and Pineo 1983; MacLeod 1995). Still

other scholars' studies of rural students do not compare their aspirations to suburban or urban students (Carr and Kefalas 2009; Cobb et al. 1989). Few sociological studies compare students' college-going aspirations across all three spatial contexts. With the ubiquity of the "college for all mentality," we have no way of knowing if aspirations operate similarly across spatial contexts. The analytical approach will establish whether the pooled models for college-going aspirations mask contextual variation.

**5.2 Measures**

In this chapter, I compare students' college-going aspirations in a pooled analysis of public school students before examining variation across three spatial contexts. The dependent measure in this analysis, *students' college-going aspirations*, comes from the ELS base-year data collected in 2002 when students were in the tenth grade. Students were asked to report their expected level of education in categorical terms. Students could choose from categories including "Less than high school graduation," "High school graduation or GED," "Attend or complete a two-year school," "Attend college but not complete a four-year degree," "Graduate from college," "Obtain a master's degree or equivalent," or "Obtain a PhD, MD, or other advanced degree."[15]

I have recoded students' responses and created a dichotomous dependent measure to reflect whether students aspire to graduate from a four-year college (or beyond). This measure

[15] It is critical to note the language used in the survey. The NCES distinguishes between two-year and four-year institutions as "schools" or "college." Of the post-secondary education options, the four-year degree, according to the NCES, is still the gold standard and other options (here two-year "schools") are not considered true "college." By these standards, I am actually measuring whether students have "post-secondary" aspirations. I make this distinction to call attention to the ubiquity of the four-year gold standard. Not all post-secondary degrees are created equally.

groups together students who responded that they aspire to graduate from college, obtain a master's degree or obtain a PhD, MD or advanced degree. The breakdown of categorical responses may be found in Appendix K. In Table 5.1, I present a descriptive comparison of students' and parents' college-going aspirations for public school students in the sample. Approximately 78 percent of public school students aspire to graduate from college and potentially pursue post-graduate training. About the same proportion of suburban students aspire to attend college. Eighty-percent of urban students in the sample aspire to attend college while seventy-five percent of rural students aspire towards four-year college graduation. Around 22 percent of the sample believes that they will have lower academic achievement than four-year college graduation. This high level of post-secondary aspirations is consistent with claims regarding students' inflated expectations about life after high school graduation (Reynolds et al. 2006; Rosenbaum 2001). The measure of parental aspirations in this table is the same measure I examined in the last analytical chapter, a dichotomous measure of whether parents aspire for their child to graduate from college. Approximately 73 percent of parents in the sample have college-going aspirations for their children, slightly lower than students' own aspirations for their future. A high percentage of urban parents report college-going aspirations for their student while two-thirds of rural parents have the same hopes for their child. While the proportion of students fostering college-going aspirations is similar in each context, the lower proportion of rural parents aspiring to college graduation for their children is noteworthy. In urban and suburban contexts where a similar proportion of both students and parents have college-going aspirations, but in rural contexts, fewer parents have these expectations for their children.

## 5.3 Methods

As in the last chapter, the analyses proceed in two phases. In the first phase I estimate four logistic regression models examining the likelihood of college-going aspirations for a pooled sample of public school students. In the first model (Model 1), I include measures of spatial context to compare urban and suburban students with their rural peers. In Model 2, I add measures of engagement with the extracurriculum, measures of technological capital, parental aspirations and social capital and a measure of distance to nearest post-secondary institution. In Model 3, I include controls for individual characteristics. In the fourth model, I incorporate school factors. I present the results for this first set of models in Table 5.2. In both Tables 5.2 and 5.3, I present both the logistic regression coefficients and the odds ratio for each measure.

In the second phase of the analysis, I disaggregate the data by spatial context and estimate three separate logistic regression models for each of three spatial contexts: urban, suburban, and rural students. First, I estimate logistic regression models for each spatial context that include measures of engagement with the extracurriculum, measures of technological capital, parental aspirations, social capital and distance to nearest college. Then, I estimate a second model that includes all of these factors while controlling for individual characteristics. In a third and final model, I control for school factors. In Table 5.3, I present this third model (similar to Model 4 in Table 5.2) for urban, suburban, and rural contexts to allow for comparison of results across spatial context. This modeling strategy allows me to show how the results for all students in the sample may mask some contextual nuances important for understanding variation in students' college-going aspirations. I outline the variables included in each model in Table 3.3.

## 5.4 Results

### *5.4.1 Pooled Analysis of Students' College-Going Aspirations*

I estimate four logistic regression models using the whole sample of students and present the results in Table 5.2. In Model 1, I include dummy measures for urban and suburban contexts, using rural students as the reference group to look at the basic differences in college-going aspirations by spatial context. In this first model, there are statistically significant differences between urban, suburban and rural students. Urban students are 32.8 percent more likely and suburban students are 17.3 percent more likely than their rural peers to have college-going aspirations. These significant differences remain after I control for other factors in subsequent models. In the fourth and final model, urban students are 51.6 percent more likely than their rural peers to have college-going aspirations. Suburban students are fifteen percent more likely than their rural peers to aspire to college graduation. Much of the literature that includes measures of context would note this finding without drilling down further to understand how these measures work within each context. These significant differences validate the chosen modeling strategy that examines each context separately.

In Model 2, I add measures of extracurricular engagement, noncognitive resources and distance to predict the likelihood of college-going aspirations. Increased engagement with the extracurriculum through club activities raises the likelihood of having college-going aspirations. As students' engagement in problem behavior increases, they are over 30 percent less likely to foster college-going aspirations. As students' engagement with club activities increases by one unit (indicating involvement in another club), they are twenty percent more likely to have college-going aspirations. Sports involvement is not significantly related to college-going aspirations in these pooled models. Model 2 incorporates measures of technological capital,

parental aspirations and social capital from the last chapter to understand how noncognitive resources impact students' future plans. In this model all five noncognitive resources are related to a greater likelihood of college attendance, however in subsequent models, three of these resources are all positively and significantly associated with students' fostering college-going aspirations. That is, greater technological capital, higher parental aspirations, and greater peer social capital are all significantly associated with having college-going aspirations. Students whose parents have college-going aspirations are much more likely to have college-going aspirations than their peers whose parents express no post-secondary expectations.[16]

The effects of these resources persist even after controlling for individual and school characteristics. This finding is important because in the last chapter, we discovered that some of these resources are stratified by context. If these resources remain important for fostering college-going aspirations and if these resources remain stratified by spatial context, then addressing contextual deficits in technological capital, parental aspirations or social capital may be one avenue for improving students' future prospects. Surprisingly, though, the measure of distance to nearest post-secondary institution is not significantly related to having college-going aspirations in these pooled models for public school students.

In Models 3 and 4, I present limited significant findings regarding students' college-going aspirations. In Model 3, I include individual characteristics to predict the likelihood of college-going aspirations. Female students are 38 percent more likely to foster college-going aspirations than their male peers. Among the race/ethnic measures, Hispanic students are 25

[16] In Appendix R, I show a table of correlations for all measures in this analysis. Students' college-going aspirations and parents' college-going aspirations do not present an issue of multicollinearity. In supplementary analyses where I exclude parental aspirations, I do not see significant effects for the measures of intergenerational closure or parent-child social capital. As such, I do not believe this measure overwhelms the model or obscures effects of other measures.

percent less likely to foster college-going aspirations compared to their white peers. As students' socioeconomic status increases, students' likelihood of fostering college-going aspirations also increases. Finally, students living in a two-parent home are 15 percent more likely to have college-going aspirations. These relationships remain significant in the final, full model. In Model 4, I control for school factors and find only two significant relationships between school characteristics and students' college-going aspirations. Students in schools with high student/teacher ratios are slightly less likely to aspire to college while students in schools with more full-time certified teachers are slightly more likely to aspire to college. In this final full model, it is important to note that the effects of context remain positive and significant even after controlling for other factors in this analysis.

### *5.4.2 Contextual Analysis of Students' College-Going Aspirations*

The models reviewed in Section 5.4.1 provide background for understanding the public school student sample broadly. As described in Section 5.3, I estimate three models for students in urban, suburban, and rural places and present these results in Table 5.3. Many of the significant effects evident in the pooled analysis presented in Table 5.2 are also consistent across spatial contexts, however there are a few important differences between these two sets of models. As in the last set of models, I present coefficients and odds ratios for the contextual analysis of college-going aspirations.

The results for measures of engagement with the extracurriculum are consistent with the findings in the pooled analysis. As students' engagement with problem behavior increases (or as they report more risky behavior), the likelihood of having college-going aspirations is at least thirty percent lower in urban, suburban and rural places. Engagement with club activities is

overwhelmingly positive and significant. As students engage with more extracurricular clubs at school, their likelihood of having college-going aspirations is higher. This relationship is evident for all three spatial contexts. There is a lone significant finding for sports participation in rural contexts. As rural student participation increases, their likelihood of having college-going aspirations increases. It is not clear from this analysis whether this means these students see their sports participation as a pathway to college or if the noncognitive skill building that happens on sports teams (like leadership, team building, perseverance) are what enliven higher post-secondary aspirations for these rural students. Either way, these findings further confirm recent research on the protective influences of the extracurriculum.

In terms of other noncognitive resources in the analysis, we see that measures of technological capital, parental aspirations, and peer social capital, as in the pooled models, are important predictors of college-going aspirations in all three spatial contexts. Access to technological capital is also overwhelmingly positive and significantly related to students' college-going aspirations. In all three contexts, the likelihood of having college-going aspirations is higher as students' technological capital increases. This finding is especially important given the limited knowledge on the importance of technology for equalizing access to information about higher education. Grodsky and Jackson (2009) suspect that greater access to technological information will be an important part of equalizing access to higher education. This finding represents an important step in further confirming this hypothesis.

Two other noncognitive resources are positively and significantly related to students' college-going aspirations in all three contexts, parental aspirations and peer social capital. Parents with college-going aspirations increase the likelihood of college-going aspirations in their children by a considerable proportion. This relationship is true for urban, suburban and rural

students alike. This finding regarding parental aspirations represents an important opportunity to improve students' likelihood of pursuing post-secondary education. In addition to parental aspirations, students with more peer social capital are more likely to foster college-going aspirations. This is true for all three spatial contexts. The impact of peers has been documented in the existing literature. Having positively engaged peers can be protective factor for students in high school (Hallinan 2005; Hallinan and Williams 1990), and here we see evidence of peer effects for college-going aspirations.

This is the first analysis that includes the measure of distance to nearest college or university. In the pooled analysis of students presented in Table 5.2, this measure was not significantly related to the likelihood of having college-going aspirations. In this contextual analysis, we see that distance to the nearest college or university exerts a significant and negative effect on the likelihood of college-going aspirations for rural students. In a supplementary analysis where I include interaction terms for distance and spatial context, I also see a decreased likelihood of aspirations with increased distance for rural students.[17] Rural students live at the furthest distance from the nearest post-secondary institution and this analysis provides evidence that distance depresses the likelihood of college-going aspirations for those who live the furthest.

Turning to the individual and school factors, there are a few important relationships across all three spatial contexts. As in the pooled model, female students were more likely than their male peers to have college-going aspirations. In urban places, female students were over one fifty percent more likely to have college-going aspirations and in rural places, female students were over forty percent more likely to foster these aspirations. Additionally, high socioeconomic status is related to a greater likelihood of having college-going aspirations for all

[17] The results of this supplementary analysis appear in Appendix L.

three contexts. As students' socioeconomic status increases, so does their likelihood of having college-going aspirations. This finding is not new, however, it is important to see that this relationship exists across all three contexts. In the literature, there is evidence that within each context, socioeconomic status operates in nuanced ways. McGrath et al. (2001) show that rural students' socioeconomic status is related to students' likelihood of going to college because even agricultural (low-SES) parents can behave like professional (high-SES) parents to push their children towards higher education. Two of the significant factors in the pooled models turn out to be relevant to suburban students' college-going aspirations. Hispanic students living in the suburbs are 45 percent less likely to aspire to graduate from college and students living in a two-parent home are 30 percent more likely to have college-going aspirations. This last finding is evidence of a crucial distinction to be drawn between the pooled and contextual models. Living in a two-parent home is only beneficial for suburban students.

Looking at the school factors, there are a few marginally significant relationships present in this contextual analysis. Students in urban and suburban schools with a high student/teacher ratio have a marginally lower likelihood of college-going aspirations. Though it was not significant in the pooled model, students in all three contexts attending schools with a higher percentage of college preparatory enrollment have a marginally higher likelihood of college-going aspirations. Suburban students attending schools with a higher vocational track enrollment, have a slightly lower likelihood of having college-going aspirations. This could be because schools with more vocational enrollment are not geared toward college-preparation. For that reason, the academic climate may be less attuned to post-secondary opportunities and as such, students are less likely to aspire to college.

## 5.5 Discussion

In this chapter, I analyze variation in students' college-going aspirations. These aspirations are part of negotiating the transition from high school to some form of post-secondary education. Aspirations are notoriously difficult to measure because they represent an abstract version of the individuals' future plans, however they are a necessary part of the transition from high school to college. In subsequent analyses, I will use college-going aspirations to predict math achievement and students' likelihood of enrolling in college. This analysis serves as a backdrop for understanding other student outcomes related to the likelihood of college attendance.

In this chapter I adopt a strategy that is uncommon in an analysis of students' post-secondary aspirations. First, I examined a pooled sample of public school students to uncover any contextual variation in the sample. For these data, there is an increased chance for urban and suburban students to foster college-going aspirations when compared to their rural peers. The evidence of these contextual differences indicates that further examination by context is warranted. In a contextual variation of this measure, however, each context had mostly similar significant relationships with a few exceptions. The notable differences set suburban students apart from their urban and rural peers. For college-going aspirations, spatial context matters in that urban and suburban students are more likely to aspire to graduate from college than their rural peers. However, the factors impacting the whether students express these aspirations are similar for all three contexts. That most of the same predictors exerted significant effects in both the pooled and contextual models indicates that students' aspirations develop similarly across spatial contexts. This is certainly an indication of the ubiquity of post-secondary education, that

no matter where you live, no matter the distance to the nearest institution, higher education is something to aspire to.

This chapter provides important insights into the process of applying to college as well as unique issues facing students in each spatial context. First, I find some common effects including the importance of gender, socioeconomic status and engagement with the extracurriculum for fostering college-going aspirations. Having parental support in the form of parents' college-going aspirations matters significantly for students' own college-going aspirations. Having parents with college-going aspirations was significant while living in a two-parent home was not significant. Additionally, access to technological capital and peer social capital are also important resources for maintaining college-going aspirations. The importance of parents signals an opportunity for schools to think about supporting their students, especially the high-achieving students who lack parental support in the home. However, living in a two-parent home is significant in the pooled model but only significant in the contextual model for suburban students. When it comes to students' college-mindedness, it appears that there is one important nuance across contexts. Enrollment in a vocational/technical track, while proven to depress aspirations in the literature (Ainsworth and Roscigno 2005; Kelly and Price 2009), seems to only be negatively related to college-going aspirations for suburban students.

As this analysis builds toward understanding the likelihood of college attendance for urban, suburban and rural students, it is impossible to ignore a few important conclusions. First, socioeconomic status continues to be a significant predictor of higher outcomes related to college attendance including several measures of social capital and now college-going aspirations. This relationship is consistent in all three contexts so that even if levels of socioeconomic status are relative to each context, those who have greater financial resources and occupational prestige can

confer extra benefits for their children within that context.[18] This provides some support for research on the intergenerational transmission of wealth and the importance of understanding how poverty can hold some students back. This finding is important for understanding contextual deficits for two reasons. First, policies aimed to equalize access to post-secondary institutions that only address school issues may fall short if they overlook the local spatial context. And secondly, socioeconomic status is associated with the forms of capital necessary to form high aspirations and this process does not happen in schools. So policies that do not address these noncognitive skills will also fall short.

Secondly, engagement with peers seems to be an important dimension of fostering college-going aspirations. Students with greater peer social capital and involvement in positive activities (like clubs or athletics) and aversion of delinquency were more likely to have college-going aspirations. The importance of this finding is similar to the severity of the socioeconomic status effects. Current policies addressing school inequality do not account for peer networks that have an impact on aspirations.

In the next chapter, I turn from noncognitive predictors of college attendance and examine cognitive measures. I incorporate this chapter's measure of students' college-going aspirations to examine the contextual differences in students' tenth grade math achievement and math test score gains. While aspirations provide a loose interpretation of students' future plans, achievement is even more closely associated with other life outcomes like high school and college graduation.

[18] The interaction terms for SES and spatial context did not yield significant results in supplementary analyses. See Appendix L.

**Table 5.1: Means and Standard Deviations for Students' and Parents' College-Going Aspirations**

| Measures | Urban | | Suburb | | Rural | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | N |
| Students' College-Going Aspirations | 0.805 $^{SR}$ | 0.396 | 0.785 $^{RU}$ | 0.411 | 0.757 $^{SU}$ | 0.429 | 0.784 | 0.412 | 9520 |
| Parental Aspirations | 0.781 $^{SR}$ | 0.414 | 0.730 $^{RU}$ | 0.444 | 0.666 $^{SU}$ | 0.472 | 0.727 | 0.446 | 8720 |

**Note:** Superscript R–mean is significantly different from mean for rural students at $p < 0.05$.
Superscript U–mean is significantly different from mean for urban students at $p < 0.05$.
Superscript S–mean is significantly different from mean for suburban students at $p < 0.05$.

**Table 5.2: Logistic Regression Analysis of Students' College-Going Aspirations, pooled models**

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | e($\beta$) | S.E. | $\beta$ | e($\beta$) | S.E. | $\beta$ | e($\beta$) | S.E. | $\beta$ | e($\beta$) | S.E. |
| **Spatial Context** | | | | | | | | | | | | |
| Urban | 0.284 | 1.328 ** | 0.099 | 0.229 | 1.257 * | 0.112 | 0.357 | 1.429 ** | 0.113 | 0.416 | 1.516 *** | 0.118 |
| Suburban | 0.159 | 1.173 * | 0.079 | 0.083 | 1.086 | 0.082 | 0.107 | 1.113 | 0.081 | 0.143 | 1.154 + | 0.086 |
| **Extracurriculum** | | | | | | | | | | | | |
| Problem Behavior | | | | -0.456 | 0.634 *** | 0.052 | -0.424 | 0.655 *** | 0.050 | -0.419 | 0.658 *** | 0.050 |
| Activity Involvement | | | | 0.212 | 1.236 *** | 0.031 | 0.156 | 1.169 *** | 0.030 | 0.158 | 1.171 *** | 0.030 |
| Sports Involvement | | | | 0.024 | 1.025 | 0.031 | 0.042 | 1.043 | 0.033 | 0.043 | 1.044 | 0.033 |
| **Noncognitive Resources** | | | | | | | | | | | | |
| Technological Capital | | | | 0.344 | 1.411 *** | 0.031 | 0.230 | 1.259 *** | 0.034 | 0.227 | 1.254 *** | 0.034 |
| Parental Aspirations | | | | 2.173 | 8.784 *** | 0.069 | 2.091 | 8.093 *** | 0.072 | 2.076 | 7.970 *** | 0.071 |
| Intergenerational Closure | | | | 0.095 | 1.100 + | 0.051 | 0.053 | 1.054 | 0.051 | 0.053 | 1.054 | 0.050 |
| Parent-child Social Capital | | | | 0.168 | 1.183 * | 0.069 | 0.060 | 1.062 | 0.072 | 0.059 | 1.060 | 0.072 |
| Peer Social Capital | | | | 0.402 | 1.494 *** | 0.041 | 0.389 | 1.475 *** | 0.041 | 0.392 | 1.479 *** | 0.042 |
| **Distance to College** | | | | | | | | | | | | |
| Distance | | | | -0.003 | 0.997 | 0.004 | -0.001 | 0.999 | 0.003 | 0.001 | 1.001 | 0.003 |
| **Individual Controls** | | | | | | | | | | | | |
| Female | | | | | | | 0.325 | 1.384 *** | 0.063 | 0.324 | 1.382 *** | 0.063 |
| Hispanic | | | | | | | -0.297 | 0.743 ** | 0.100 | -0.286 | 0.751 ** | 0.107 |
| Black | | | | | | | -0.086 | 0.917 | 0.106 | -0.109 | 0.896 | 0.116 |
| Asian | | | | | | | -0.015 | 0.985 | 0.138 | -0.023 | 0.977 | 0.138 |
| SES | | | | | | | 0.544 | 1.723 *** | 0.052 | 0.509 | 1.664 *** | 0.054 |
| South | | | | | | | 0.103 | 1.109 | 0.070 | 0.080 | 1.084 | 0.072 |
| Two-parent | | | | | | | 0.146 | 1.158 * | 0.066 | 0.146 | 1.157 * | 0.066 |
| Number of siblings | | | | | | | -0.018 | 0.982 | 0.025 | -0.012 | 0.988 | 0.025 |
| Mobility | | | | | | | -0.026 | 0.975 | 0.022 | -0.025 | 0.975 | 0.022 |
| **School Factors** | | | | | | | | | | | | |
| Percent minority enrollment | | | | | | | | | | 0.002 | 1.002 | 0.002 |
| Student/teacher ratio | | | | | | | | | | -0.024 | 0.976 * | 0.010 |
| Percent receiving free/reduced price lunch | | | | | | | | | | -0.003 | 0.997 | 0.003 |
| Percent of FT teachers certified | | | | | | | | | | 0.000 | 1.000 | 0.003 |
| Percent enrolled in college prep | | | | | | | | | | 0.004 | 1.004 ** | 0.001 |
| Percent enrolled in vocational/technical | | | | | | | | | | -0.003 | 0.997 | 0.002 |
| *Constant* | 1.137 | 3.117 *** | 0.062 | -0.119 | 0.887 | 0.094 | -0.182 | 0.833 | 0.135 | 0.053 | 1.054 | 0.352 |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001
N = 9,520

**Table 5.3: Logistic Regression Analysis of Students' College-Going Aspirations, contextual models**

| | Urban (N = 2,400) | | | | Suburban (N = 4,820) | | | | Rural (N = 2,290) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | e($\beta$) | | SE | $\beta$ | e($\beta$) | | SE | $\beta$ | e($\beta$) | | SE |
| **Extracurriculum** | | | | | | | | | | | | |
| Problem Behavior | -0.355 | 0.701 | *** | 0.100 | -0.467 | 0.627 | *** | 0.076 | -0.421 | 0.656 | *** | 0.088 |
| Activity Involvement | 0.189 | 1.208 | ** | 0.070 | 0.143 | 1.154 | ** | 0.044 | 0.159 | 1.172 | ** | 0.057 |
| Sports Involvement | 0.001 | 1.001 | | 0.065 | 0.024 | 1.024 | | 0.048 | 0.121 | 1.129 | * | 0.058 |
| **Noncognitive Resources** | | | | | | | | | | | | |
| Technological Capital | 0.192 | 1.212 | ** | 0.056 | 0.247 | 1.280 | *** | 0.047 | 0.221 | 1.247 | ** | 0.072 |
| Parental Aspirations | 1.877 | 6.536 | *** | 0.146 | 2.085 | 8.042 | *** | 0.098 | 2.281 | 9.790 | *** | 0.144 |
| Intergenerational Closure | 0.102 | 1.107 | | 0.107 | 0.088 | 1.092 | | 0.072 | -0.080 | 0.923 | | 0.090 |
| Parent-child Social Capital | 0.079 | 1.082 | | 0.116 | 0.053 | 1.055 | | 0.100 | 0.059 | 1.060 | | 0.166 |
| Peer Social Capital | 0.351 | 1.421 | ** | 0.093 | 0.399 | 1.490 | *** | 0.064 | 0.422 | 1.525 | *** | 0.083 |
| **Distance to College** | | | | | | | | | | | | |
| Distance | -0.010 | 0.990 | | 0.026 | 0.004 | 1.004 | | 0.003 | -0.014 | 0.986 | * | 0.005 |
| **Individual Controls** | | | | | | | | | | | | |
| Female | 0.414 | 1.513 | ** | 0.129 | 0.253 | 1.287 | ** | 0.087 | 0.367 | 1.443 | ** | 0.130 |
| Hispanic | -0.125 | 0.882 | | 0.201 | -0.426 | 0.653 | ** | 0.142 | -0.065 | 0.938 | | 0.291 |
| Black | -0.019 | 0.981 | | 0.192 | -0.187 | 0.829 | | 0.164 | -0.048 | 0.954 | | 0.266 |
| Asian | 0.169 | 1.185 | | 0.249 | -0.198 | 0.820 | | 0.192 | 0.239 | 1.269 | | 0.440 |
| SES | 0.481 | 1.617 | *** | 0.103 | 0.550 | 1.733 | *** | 0.079 | 0.468 | 1.596 | *** | 0.116 |
| South | -0.118 | 0.889 | | 0.152 | 0.159 | 1.173 | | 0.104 | 0.132 | 1.141 | | 0.154 |
| Two-parent | -0.016 | 0.984 | | 0.138 | 0.268 | 1.307 | ** | 0.092 | 0.050 | 1.052 | | 0.146 |
| Number of siblings | -0.036 | 0.964 | | 0.048 | -0.001 | 0.999 | | 0.037 | -0.018 | 0.982 | | 0.047 |
| Mobility | -0.081 | 0.922 | + | 0.044 | 0.021 | 1.022 | | 0.031 | -0.058 | 0.944 | | 0.043 |
| **School Controls** | | | | | | | | | | | | |
| Percent minority enrollment | 0.006 | 1.006 | | 0.004 | 0.003 | 1.003 | | 0.002 | -0.007 | 0.993 | + | 0.004 |
| Student/teacher ratio | -0.044 | 0.957 | + | 0.023 | -0.023 | 0.977 | + | 0.012 | -0.004 | 0.996 | | 0.024 |
| Percent receiving free/reduced price lunch | -0.006 | 0.994 | | 0.008 | -0.004 | 0.996 | | 0.004 | 0.005 | 1.005 | | 0.006 |
| Percent of FT teachers certified | 0.001 | 1.001 | | 0.004 | 0.000 | 1.000 | | 0.003 | -0.009 | 0.991 | | 0.011 |
| Percent enrolled in college prep | 0.005 | 1.005 | + | 0.003 | 0.003 | 1.003 | * | 0.002 | 0.005 | 1.005 | * | 0.002 |
| Percent enrolled in vocational/technical | 0.001 | 1.001 | | 0.004 | -0.008 | 0.992 | ** | 0.002 | 0.005 | 1.005 | | 0.003 |
| *Constant* | 0.744 | 2.105 | | 0.755 | 0.202 | 1.224 | | 0.467 | 0.499 | 1.646 | | 1.078 |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

# CHAPTER 6: HIGH SCHOOL MATH ACHIEVEMENT

## 6.1 Introduction

A sociological understanding of student success has grown to include both their individual achievement as well as individual and structural factors related to success like social capital and other noncognitive resources. The first two analytical chapters in this project focused on students' noncognitive resources, specifically, technological capital, parental aspirations, parent-child social capital, peer social capital, intergenerational closure and students' college-going aspirations. In these two chapters, I conducted a contextual analysis to illustrate how spatial context is associated with educational outcomes, specifically the likelihood of college attendance. Scholars have shown connections between these noncognitive resources and race/ethnic, class and gender inequalities, and they are also important for understanding why some students choose to pursue higher education and others do not. In this chapter, I shift focus and examine cognitive resources that are related to the pursuit of higher education.

Academic ability, most often studied as academic achievement, is a crucial cognitive resource associated with the pursuit of post-secondary education (Deil-Amen and Turley 2007; Gamoran 2001; Grodsky and Jackson 2009). Students that have higher academic achievement are presumably more academically prepared for college-level work. Students with greater academic achievement are also more likely to apply to college (Grodsky and Jackson 2009; Hanson 1994; Klasik 2012). So while the transition from high school to post-secondary education hinges on several key factors (Klasik 2012), academic achievement remains an important piece of our understanding how the likelihood of college attendance may vary across students. The sociology of education literature examining the stratification of achievement

outcomes like grades, grade point averages and standardized test scores is robust, but consensus regarding the spatial stratification of these outcomes has not been reached. To understand the spatial variation in likelihood of college attendance, I examine spatial stratification of academic ability itself.

In this chapter, I consider the following question: *what are the contextual differences in the way noncognitive resources combined with other factors and college-going aspirations affect high school math achievement?* Academic achievement is widely studied and we understand many of the relationships between demography, school characteristics, and student success as measured on standardized tests. This literature confirms the relevance of factors like a student's gender, race/ethnicity or socioeconomic status as predictors of students' academic success. Beyond socio-demographic factors, school characteristics including small class size, engaging relationships between teachers and students, and the availability of an academically rigorous curriculum are positively related to student achievement. However, much of this literature addresses context by controlling for the impact of living in or attending school in a particular spatial context without focusing on variation within each spatial context.

My approach for analyzing student achievement includes both a snapshot of achievement as well as a measure of progress over time. In this chapter, I examine students' tenth grade math achievement as well as their test score gains from tenth to twelfth grade. By considering achievement in the middle of high school as well as potential gains over time, I contribute both methodologically and substantively to the broader understanding of student achievement. Methodologically, I compare how traditional explanations of stratification predict a static measure of cognitive ability and a measure of cognitive growth. Substantively, the two measures represent different cognitive outcomes. To understand how their impact on the likelihood of

college attendance varies, I must first consider spatial variation in these outcomes. In addition to the methodological and substantive contributions of the analysis, I extend the literature by examining the factors associated with student achievement for urban, suburban and rural students specifically. Scholars tend to separate urban and rural students from one another or make statistical comparisons by lumping students in seemingly different contexts together as a reference group. So even though achievement is well studied, this analysis considers context more closely. We know that spatial contexts are increasingly segregated by level of education (Domina 2006), and if students are to be academically prepared for pursuit of higher education, we must attend to understanding spatial stratification of student outcomes in addition to race/ethnic, gender, and class stratification.

**6.2 Measures**

In this analysis, I include two dependent measures of student achievement: tenth grade math achievement and test score gains. The decision to use math test scores is substantive and pragmatic. Substantively, math ability (as compared to reading ability) is a potentially more objective measure of student achievement as it is less susceptible to bias from outside influences like family or peers (Muller 1998; Useem 1992). Pragmatically, the ELS collected both math and reading test scores in the tenth grade but only math scores in the twelfth grade. If there were a possibility of examining change over time, it would only be possible with math scores. I created the test score gains measure using simple subtraction. Greater values of test score gains indicate students experiencing positive cognitive growth.

Building on the last two chapters, I estimate nested regression models using measures of noncognitive resources and students' college-going aspirations while controlling for individual

and school characteristics. The noncognitive measures include students' technological capital, parental aspirations, intergenerational closure, parent-child social capital, and peer social capital. Students' college-going aspirations and distance to the nearest college also predict variation in students' math achievement. To control for individual student characteristics, I add measures of gender, race/ethnicity, socioeconomic status, family structure (two-parent home, number of siblings), region (living in the south), and residential mobility. To control for school characteristics, I include measures of minority enrollment, school poverty, percentage of full-time certified teachers, percentage of enrollment in college-preparatory courses and percentage of enrollment in vocational/technical courses.

I present descriptive statistics for the measures in this analysis in Tables 6.1 and 6.2. In Table 6.1, I compare students' tenth grade math achievement and test score gains across urban, suburban, and rural contexts. In Table 6.2, I present descriptive statistics for all of the measures in the models for students at the high, middle and low end of the math test score distribution.[19] This table contextualizes the data as I explore the profile of a high scoring, average scoring and low scoring student. Looking at Table 6.1, suburban students have the highest average tenth grade math scores as well as the highest test score gains of all three contexts. Where urban students have had some advantages over suburban and rural students in terms of parental aspirations, social capital or post-secondary aspirations as discussed in earlier chapters, they have the lowest average tenth grade math scores. Suburban and rural average math achievement is largely similar and both are significantly higher than urban students' test scores. Rural students may not have the lowest average tenth grade math scores but they do have the lowest test score

[19] To create the high, average and low scoring categories, I divided the test score distribution into thirds. I then created dummy measures of students' membership in each group based on their tenth grade math achievement scores.

gains. While the last two years of high school represent a time for students who have otherwise lagged behind to catch up to their peers (Blau et al 2001), the low score gains evidenced by rural students may be further confirmation of Carr and Kefalas's hypothesis that rural schools invest only in those academically competent students. Thus students who have always lagged behind may not eventually catch up.

In Table 6.2, I provide descriptive information for respondents in high scoring, average scoring and low scoring groups. This table provides a profile of students at the extremes of the distributions of math scores for the pooled public school student sample. Among the high scoring students, on average these students exhibit the least engagement with delinquent behavior and the greatest engagement with club activities. High scoring students are the least involved in athletics, compared with average and low scoring students. Ninety-nine percent of students and ninety-four percent of their parents foster college-going aspirations. This finding is not surprising but confirms the ubiquity of college-going aspirations. High scoring students have the highest technological capital as well as the highest level of intergenerational closure and peer social capital. Having social resources that reaffirm the importance of education is related to better student outcomes (Sandefur et al. 2006), so this finding for high scoring students confirms what we know in the literature. While it is not clear whether technological capital increases students' access to resources that would directly boost their achievement, it is important to know on a basic level that high scoring students have greater technological capital. There are fewer women among the high scoring students, and these students have the highest average socioeconomic status. High scoring students attend schools with lower levels of school poverty and lower minority enrollment. The schools these students attend do not have appreciably lower student/teacher ratios or higher percentage of full-time certified teachers, but they do have more

students enrolled in college-preparatory courses. With more students engaged in the pursuit of higher education, high scoring students may benefit from an environment that facilitates the transition from high school to college more easily.

While the low scoring group generally has the lowest average values for most measures in this analysis, there are a few important distinctions for the average scoring group. This group has the highest average parent-child social capital for all three groups. This group also lives at the greatest distance from the nearest college or university. Many of the other average values for independent measures do not vary so drastically from the high scoring group. Ninety-six percent of average scoring students and eighty percent of their parents aspire to post-secondary education. This finding is telling considering academic excellence is nearly required for admission to college. If most average scoring students also aspire to college, this could be evidence of Rosenbaum's "college for all" mentality penetrating from the highest achievers into the average achieving group.

These two tables provide a general sense of the kind of student in each spatial context and at each spectrum of achievement for this sample. In the next section, I discuss the analytical strategy for the regression models before I present the results in Section 6.4. I limit the sample to public school students for whom there is complete data in tenth and twelfth grade. As such, the final analytical sample for this chapter is 9,320.

### 6.3 Methods

I use ordinary least squares (OLS) regression to estimate the models in this chapter because tenth grade math achievement and test score gains are both continuous measures. I perform two sets of analyses for each dependent measure. I estimate OLS regression models for

tenth grade math achievement and for test score gains for the pooled sample of public school students. In these pooled models, I perform a simple set of regressions for each dependent measure, including only dummy variables for urban and suburban context (using rural students as the reference category). The general approach to these models may be found in Table 3.3. The purpose of these simple models is to establish initial differences in these measures across contexts. In Model 2, I include measures of the engagement with the extracurriculum and noncognitive resources including problem behavior, engagement with clubs, engagement with sports, technological capital, parental aspirations, three measures of social capital, and distance to college. I incorporate students' college-going aspirations in Model 3. In the fourth and fifth models, I control for individual demography (M4) and school characteristics (M5) to see if any contextual differences are explained by factors other than spatial context. I follow this estimation strategy for tenth grade math achievement and for test score gains. For ease of comparison and discussion, I present the final, fifth model for each measure in Table 6.3 in the next section.

Extending this traditional approach, in a second set of analyses, I disaggregate the data by spatial context and estimate nested OLS models examining the relationship between individual or school measures and each dependent measure. In these analyses, I first regress math achievement and test score gains on measures of engagement with the extracurriculum, noncognitive resources, and distance to nearest college (Model 1). In a second model, I add students' college going aspirations. In a third and fourth model, I control for individual characteristics (M3) and school characteristics (M4), respectively. As in the discussion above, I present the final, fourth model for all three contexts for ease of comparison. In Table 6.4, I

present the contextual analysis of tenth grade math achievement and the contextual analysis of test score gains appears in Table 6.5.

## 6.4 Results

### *6.4.1 Pooled Analysis of Tenth Grade Math Achievement and Test Score Gains*

The results for the pooled analysis of tenth grade math achievement and test score gains appear in Table 6.3. In these models, I compare urban and suburban students with their rural peers. As in earlier chapters, this analysis includes only public school students in schools with at least five total respondents. Focusing first on the results for tenth grade math scores, there are no significant differences between urban, suburban and rural students in their achievement. Though context may not represent statistically significant differences in math test scores in these final, full models, I conduct a contextual analysis to further understand how factors may work for a specific spatial context.

In terms of engagement with the extracurriculum, there are cognitive advantages for students engaging with the rewards to education. For every point increase in the measure of problem behavior scale, indicating greater delinquency, students score 1.7 points lower on their math achievement tests. The same negative relationship exists between math achievement and involvement with athletics. Students' increased involvement in school clubs, however, is associated with increased tenth grade achievement. The findings regarding extracurricular clubs aligns with existing research on the positive effects of extracurricular engagement for improving cognitive outcomes.

Among the noncognitive resources, we see that students whose parents aspire to post-secondary education score over five points higher on their math achievement tests. If students,

themselves, foster college-going aspirations, they score an additional 5.8 points higher on these tests. This boost from aspirations is meaningful for student achievement. While college-going aspirations may represent abstract attitudes towards future plans, students who maintain that they will go to college see a statistically significant boost to their tenth grade math achievement and test score gains. This finding runs counter to some scholarship that maintains students' abstract attitudes regarding the value of schooling are misaligned with their concrete academic achievement (Mickelson 1990). This finding is also especially noteworthy because of the boost students enjoy due to their parents' aspirations. While parental support is an important component of pursuing a post-secondary education, in these models, parents' postsecondary goals are associated with an increase in test scores equivalent to the benefits of students' own aspirations. Taken together, students perform over ten points higher when both they and their parents are oriented toward higher education.

Technological capital and intergenerational closure are also positively related to both measures of achievement. It is apparent in these models that access to technology has benefits for math achievement. As high school math may be challenging for parents to keep up with, students with greater access to the Internet can seek help on the internet or even use technological applications to help with their homework. Greater intergenerational closure, the closed social networks maintained by parents, are associated with higher tenth grade math achievement. If students' families are part of large social networks where the rewards of education are constantly reinforced, then that student is found is a closed-loop of sorts, where expectations and support for high achievement are unmistakable. This finding is consistent with the literature where broader social networks have been shown to have positive effects on students' achievement in various forms (Carbonaro 1998; Crosnoe et al. 2003; Morgan and Sorensen 1999).

However, parent-child social capital is negatively related to math achievement. Students with greater parent-child social capital see a slight decrease in their math achievement scores. Parent-child social capital is based on the time spent with parents doing social activities. It is possible that students with greater parent-child social capital are spending less time on their actual schoolwork and more time on social experiences. One of the twelve items in the parent-child social capital measure is a parent response to whether they help students with their homework or with school projects. So students with higher parent-child social capital are busy with their parents participating in various activities and may be taking time away from their studies. Additionally, students with higher peer social capital see a slightly lower tenth grade math test score. While this relationship remains significant even after controlling for individual and school factors, the coefficient is relatively small (-0.396), indicating that students with greater peer social capital, or greater peer support in school, are not endangering their chances of greater math achievement. These two negative relationships are consistent even after controlling for individual and school factors. I include a measure of proximity to the nearest college or university in this analysis of student achievement. In these models, the distance to the nearest post-secondary institution is not significantly related to students' math achievement.

Among the individual and school controls included in the model, there are a few notable results. Female students score over two points lower than their male peers on their tenth grade math achievement tests. Race/ethnic stratification found in the literature is evident for this sample of students. Hispanic students score over three points lower and black students score six points lower when compared with their white peers, respectively. The significant relationships for female and black students are present in the model predicting variation in test score gains. There is also evidence of class stratification in this sample; for each unit increase on the

socioeconomic status scale, students score 3.5 points higher. As students' socioeconomic status increases, their test score gains also increase. Among the school characteristics, surprisingly only two are significantly related to math achievement. Students attending schools with higher poverty levels score slightly lower than their peers, while students attending schools with more college-preparatory enrollment score slightly higher tenth grade math achievement. Beyond these two factors, I do not see as many school factors related to student achievement. Given the literature on the importance of factors like an engaged teacher staff or the availability of an academically oriented curriculum among others, it is surprising that there are only two significant relationships in these models.

Turning to test score gains, we see a very similar picture. Engagement with the extracurriculum is important for improving math achievement over the last two years of high school. As with tenth grade math achievement, engagement with problem behavior and greater athletic involvement are both negatively related to test score gains. Scholars have noted that simple engagement with delinquent behavior is potentially damaging to student outcomes, and prolonged engagement in this kind of behavior could have serious long-term consequences for educational opportunities (Matsueda and Anderson 1998).[20] College-going aspirations held by either students or their parents increase test score gains for students. Black students do not experience significant test score gains and in fact, see negative gains occur over the last two years (on average). Asian students and increasing socioeconomic status are both associated with greater test score gains. In these models, only family size matters for test score gains. The same school characteristics matter in the case of test score gains though the coefficients are smaller.

[20] While the measures of problem behavior and engagement with athletics are drawn from the first data collection, it is not possible for us to know whether students' engagement increased over time.

Students attending schools with high rates of free/reduced-price lunch recipients experience lower test score gains. Conversely, students attending schools with greater college preparatory enrollment experience slightly higher test score gains.

While this analysis is straightforward, there are a few notable findings. First, the literature touts the benefits of engagement with the extracurricular activities for student achievement and there is some evidence of this in the current analysis. However, the kind of extracurricular engagement matters for student success. Club activities have a positive effect on students' math achievement while engagement with sports seems to depress static achievement and test score gains. Past analyses of student achievement have not considered technological capital and this analysis, we see that there is a positive relationship between access to technology and math achievement. Even after controlling for individual and school factors, this relationships remains. It is important to note that the measures for engagement with the extracurriculum, noncognitive resources, and individual characteristics are all drawn from the base-year data collection. In this analysis of test score gains, I am assessing how tenth grade characteristics affect later cognitive outcomes, assuming that these measures have held constant over the last two years of high school.

### *6.4.2 Contextual Analysis of Tenth Grade Math Achievement and Test Score Gains*

In this section, I conduct a contextual analysis of public schools students, estimating models using the analytical strategy described earlier in this chapter. For ease of discussion, I present the final full for each of three spatial contexts in Tables 6.4 (tenth grade math achievement) and 6.5 (test score gains) and review my findings in this section.

In Table 6.4, I present the contextual analysis for tenth grade math achievement. The story for these predictors appears similar to the pooled analysis on its face. There are some nuances that will be evident in the following discussion, including the significance of distance for predicting rural student achievement. Beginning with engagement with the extracurriculum, we see that these measures have similar effects in each context as they did in the pooled sample. Students engaging in more problem or risky behaviors have lower tenth grade math achievement. Student engagement in extracurricular clubs is also consistent across contexts. Greater club involvement is associated with higher tenth grade math achievement in urban, suburban and rural places. Sports involvement is negative and significant in these models for urban and suburban students. But unlike the larger sample, in rural places, greater sports involvement is not significantly related to math achievement.

Secondly, the noncognitive resources in the form of parental aspirations, technological capital and social capital are mostly consistent with the larger sample with a few exceptions. Whereas parental college-going aspirations and students' college-going aspirations were associated with a similar boost in math achievement, in this spatial analysis, there are some differences across contexts. For suburban students, having college-going aspirations is associated with a smaller improvement in test scores than parents' aspirations. While having college-going aspirations is positively related to math achievement for all three contexts, the coefficient for students' aspirations ($\beta = 5.727$) is greater than the coefficient for parents' aspirations ($\beta = 5.042$), indicating that students' future plans are associated with slightly higher achievement. Suburban students whose parents have college-aspirations see an increase of 4.5 points in their tenth grade math achievement scores. Urban and rural students whose parents have college-going aspirations for them see their test scores increase by five and six points,

respectively. In these models, while students see benefits to their test scores from fostering college-going aspirations, the greatest boost occurs when students and their parents foster college-going aspirations.

Of the social capital measures, there are two significant relationships. Whereas in the pooled model, we believed that intergenerational closure was important for tenth grade math achievement, in these contextual models, it is evident that intergenerational closure is a suburban phenomenon. Intergenerational closure is associated with a boost in test scores but only for suburban students.[21]

There is a notable finding for the measures of distance to college and college-going aspirations. Additionally, though proximity to college was not a significant predictor in the broader sample, in the models estimated for rural students, greater distance to the nearest college or university is associated with slightly higher math achievement. While Turley (2009) shows that greater distance to the nearest post-secondary institution could depress students' likelihood of applying to college, the present analysis shows slightly different results. Recall that rural students live at the greatest distance to the nearest institution of higher education compared with their urban and suburban peers. Rural students' average tenth grade math achievement is closer to suburban math achievement and higher than urban math achievement. Since rural students on average live further from an institution of higher education, perhaps rural student achievement is unaffected by greater distance. In the last chapter we saw that greater distance depressed rural student aspirations, and perhaps the distance factor is important for students ambitions or expectations but not their actual achievement. The coefficient, while significant, is still quite

[21] In a supplementary analysis of the pooled data, I tested this difference using an interaction term (suburban*intergenerational closure). In the supplementary models I estimated, this interaction term was positive and significant.

small. For every ten-mile increment of distance, rural students see less than one point improvement in their tenth grade math achievement.[22]

Among the individual factors, there are similar effects for the gender, race/ethnic and social class predictors in these models. Female students have significantly lower math achievement when compared with their male peers in all three contexts. Additionally, Hispanic and black students score significantly lower than their white peers in all three contexts. As students' socioeconomic status increases so does their math achievement, regardless of spatial context. For every unit increase in socioeconomic status, students see at least three points or more added to their math achievement score. While the effect of residential mobility is similar in all three contexts, having more siblings is only negatively related to achievement in urban and suburban places.

The school factors included in these models provide an important comparison across all three spatial contexts. While school size is often cited as an important factor in student success, here student/teacher ratio was not significantly related to math achievement in any spatial context. School poverty as measured using the percentage of students receiving free or reduced price lunch does show us that greater school poverty is associated with lower math achievement in all three contexts. Urban students enrolled in schools with a higher percentage of those enrolled in college-preparatory courses see a slight improvement in their tenth grade math achievement. And finally, suburban students attending schools with a high enrollment in vocational classes have slightly lower tenth grade math achievement. These findings regarding

[22] I also tested this significant difference using interaction terms and found supportive evidence that it is significant in the pooled model. See Appendix M.

tracking further confirm existing literature, however, it is clear that the availability of a diverse curriculum is not always beneficial to all students.

I present the results of the contextual analysis of test score gains in Table 6.5. In this table, there are fewer significant relationships between the predictors in the models and test score gains. Measures of extracurricular engagement exert similar effects in these contextual models compared with the contextual models for tenth grade math achievement. However, involvement with athletics is only marginally and negatively associated with suburban students' test score gains. Where athletic involvement depressed urban and suburban students' tenth grade math achievement, cognitive growth over time as measured using test score gains appears relatively unaffected.

Among noncognitive resources, there is some consistency between the pooled and contextual model, with a few exceptions. First, parental aspirations are universally positively associated with test score gains, but this is the only noncognitive resource significant in all three contexts. In the case of parental and student aspirations, it is important to note that unlike the pooled and contextual models for tenth grade math achievement, parental aspirations significantly predict test score gains for all three contexts, but students' own college-going aspirations in urban contexts are unrelated to their test score gains net of their parents' aspirations. Parents with college-going aspirations boost their students' test score gains by less than two points. While the snapshot of test scores (as in the analysis presented in Table 4.4) indicated that abstract attitudes and concrete achievement could be aligned, here we see the potential attitude-achievement mismatch that Mickelson referred to in her work.

Two other measures of social capital are significantly related to test score gains. As in the contextual models for tenth grade math achievement, intergenerational closure is positively

related to suburban students' test score gains. Whereas in parent-child social capital was negatively related to tenth grade math achievement is all three contexts, in these models I observe this effect for urban and suburban students. The finding for intergenerational closure and suburban student achievement shows that closed social networks are important for predicting cognitive growth. However, the findings for parent-child social capital remain confounding. As parents develop relationships with their children, subsequent cognitive growth seems more likely to increase rather than decrease. The coefficients for parent-child social capital measures in both urban ($\beta$ = -0.637) and suburban ($\beta$ = -0.954) are marginal, however.

Urban and rural students living at a greater distance to the nearest institution see a very marginal but significant increase in their test score gains. I test these differences across contexts in a supplementary analysis where I include interaction terms for spatial context and distance (distance*urban, distance*suburban) in the pooled sample of students.[23] I show significant differences for these terms, confirming their relevance in these contextual models. However, because the coefficients are small, students living at a great distance would see small benefits to their test score gains.

Fewer individual and school characteristics are significantly associated with test score gains. Female students and higher-SES students are significant predictors of test score gains. Female students experience negative gains, and their declining test scores are worst for rural students. Black rural students see negative gains from tenth to twelfth grade, scoring lower than their white peers. The increased test score gains for Asian students observed in the pooled model are relevant only for suburban Asian students. As students' socioeconomic status increases by

[23] See Appendix N.

one unit, they see an increase in their test score gains. These gains are highest for rural students and lowest for urban students. Among the school characteristics, only school poverty is negatively related to suburban and rural test score gains. Greater school poverty is associated with negative gains in these contexts. For suburban students, increased enrollment in college-preparatory courses is associated with increased test score gains.

In a supplementary analysis of the pooled sample of students, I include dummy measure for students' membership in either the high scoring or average-scoring groups as detailed earlier in this chapter's descriptive discussion. This analysis appears in Appendix O. In these models, there is a significant and negative relationship between high and average scoring students and their test score gains. That is, students who are average or above average in math have lower test score gains than their low-scoring peers. Theoretically, high scoring students have smaller margins of improvement than students who are low scoring.

### 6.5 Discussion

In this chapter, I analyze two measures of students' math achievement to illustrate variation in cognitive resources related to the likelihood of college attendance. By considering both a static measure of achievement as well as a measure of test score gains, I examine cognitive ability and cognitive growth for the pooled sample as well as in the contextual samples. Doing this, I expand our understanding of students' achievement at two specific times in their high school career as well as how traditional explanations for stratification of outcomes might vary between spatial contexts. I contribute to the limited literature comparing student achievement across spatial context as well.

This chapter included two measures of student achievement, a snapshot of student achievement in tenth grade and a measure of gains over the last two years of high school. Achievement may be measured in any number of ways, but in this chapter, we see that measurement matters for discussing achievement. Many of the independent predictors had a similar relationship for both tenth grade math achievement and test score gains in the pooled models, but there were some noticeable differences in the contextual analysis of each measure. The significance of some measures, including technological capital and parental aspirations, was present in the contextual models for base-year math achievement but not test score gains. Conversely, other variables were relevant to test score gains but not for tenth grade math achievement. Considering distance to nearest college, for instance, was significant to urban and rural test score gains but not to suburban test score gains or tenth grade achievement in all three contexts.

Fewer individual characteristics predict variation in test score gains than they do for tenth grade math achievement. Though using the multiple imputation commands to estimate the models prevents me from estimating fit statistics, I have imputed the data using a less sophisticated method and conducted a supplementary analysis to examine the model fit of the contextual models.[24] The contextual models analyzing tenth grade math achievement have $R^2$ values between 0.281 and 0.402, which means these models predict almost thirty percent to almost forty percent of the variation in tenth grade math achievement. The $R^2$ values for the

[24] I have imputed the data using the less sophisticated "impute" command in Stata that uses a subset of variables in the dataset to replace missing data. Unlike like the "MI" interface, this imputation is based on a smaller subset of information and is useful for preliminary analyses. I have conducted these supplementary analyses to compare model fit for these measures.

contextual models examining test score gains are lower, from 0.112 to 0.158. It is possible that I am missing of the predictors of test score gains.

There are some consistent results between the pooled and contextual models and there are some important distinctions evident in the analytical results. The analytical approach I adopt in this chapter does show that contextual nuances may be overlooked in a traditional analysis of student outcomes using dummy measures for spatial context. When it comes to studying achievement, I show that lumping or grouping students in disparate spatial contexts limits our understanding of what impacts academic success. For example, in both the pooled and contextual models of both achievement measures, school factors that are significant in the pooled model may not be significant to all three contexts. In the pooled models for tenth grade math achievement, students enrolled in high schools with a robust college-preparatory curriculum have significantly higher tenth grade math achievement and test scores. However in the contextual models we see the benefit is related to urban student tenth grade achievement or suburban test score gains. Beyond the methodological approach, the results presented in this chapter confirm the importance of factors like individual and school socioeconomic status as well as the relevance of less-studied factors like technological capital and distance to college.

In this analysis, technological capital and distance to college represent physical and virtual exposure to higher education that is significantly related to math achievement. While information and proximity are both important for transitioning from high school to college, including measures like technological capital and distance to college add to our general understanding of college attendance and achievement in different ways. Greater technological capital means students have access to the resources that broaden their worldview without leaving the comfort of their local community. In this analysis, technological capital is positively and

significantly related to both math achievement and test score gains for all students in the pooled models. In the contextual analysis, technological capital is only significantly related to test score gains for urban students. Technological capital was highest among the highest scoring students in the sample, thus it is an important piece of understanding variation in achievement. The measure of distance represents another form of exposure to higher education. In theory, proximity to higher education is also related to an expanded worldview for students. Students who have closer access to higher education may begin to consider post-secondary enrollment as a possibility for their future plans (Turley 2009). In the pooled analysis, distance is not significantly related to either dependent measure. However, in the contextual analysis, distance is a significant predictor of math achievement and test score gains for rural students as well as test score gains for urban students. Even though rural students live at a greater distance from the nearest college or university, this distance seems to impact students' academic achievement positively, motivating them to excel in their studies for an opportunity to attend this institution. This significant difference is supported in interaction models conducted in a supplementary analysis. Traditionally, analyses have not considered proximity to post-secondary institution to illustrate variation in different student outcomes, but this measure adds to our growing understanding of the factors related to both student achievement (in this analysis) and the likelihood of college attendance (in the larger project).

Fostering an affinity toward post-secondary education is an important predictor of math achievement for all students. This finding is important for understanding how to keep students engaged in school life. Few scholars have explored this relationship looking at students in specific geographic contexts. Carr and Kefalas (2009) show that rural places only invest in those with academic ability but this analysis shows that fostering post-secondary aspirations among

rural students is related to higher achievement. Developing aspirations in students has never been the direct responsibility of high schools, but some schools have access to experiences that could expand students' worldview to consider post-secondary education more seriously. In this analysis we see that both parental and student aspirations are important for tenth grade student achievement, but students' own aspirations are not significantly related to test score gains. Academically competent students without parental support for post-secondary education will potentially flounder without support from their high schools. If schools adopt strategies as discussed by Hill (2008) whereby they expose students to post-secondary opportunities, there is a possibility of increasing post-secondary attendance in spatial contexts where post-secondary attendance is lower. Though college-going aspirations are a predictor of tenth grade math achievement but not for test score gains. Test score gains measure the change in students' test scores between tenth and twelfth grade. This is incidentally the same time students begin their preparation for college application and enrollment.

As in existing scholarship, socioeconomic status of families and schools plays an important role in high student outcomes. In all analyses presented, students coming from a high socioeconomic background exhibit higher tenth grade math achievement and greater test score gains. This relationship is evident in the contextual analyses as well.[25] Given the emphasis on socioeconomic status in the literature, this finding is not surprising, but it is important to mention because greater socioeconomic resources are associated with added noncognitive resources and additional technological capital, both of which are crucial for students' overall academic success. All of these factors combined can propel already advantaged students further, making it

[25] Supplementary analyses of enhanced SES effects did not yield significant results for tenth grade math scores or test score gains.

challenging for students from a lower social class status to keep up with their peers even if they are high achieving (Hoxby and Avery 2012).

There were few school characteristics related to students' math achievement. This finding is surprising considering the glut of educational research on factors in the school setting related to students' achievement including class size and teacher characteristics among other relevant characteristics. Two school factors are significantly related to math achievement. We see that school poverty is significantly related to better student outcomes in all analyses. Of the school factors it is the one factor that is negatively related to tenth grade math achievement for all three contexts. Enrollment in college preparatory classes is important for achievement as well. But in terms of context, enrollment in college prep courses is related to test score gains only for suburban students. It is not possible to know whether college preparatory courses are more important for students during this period of test score gains but sufficient enrollment signals a school climate that is attuned to the things students need to do to apply to college (Hill 2008). Research on underachievement has focused on school segregation, yet here the predictors of underachievement are school poverty and enrollment in college preparatory courses rather than racial/ethnic homogeneity.

In this chapter, I have analyzed two measures of student achievement and found some important distinctions between pooled and contextual analyses of the data. Math achievement represents a cognitive resource related to the likelihood of college attendance. In the next and final chapter, I combine the cognitive and noncognitive predictors to evaluate the likelihood of college attendance in urban, suburban, and rural contexts.

**Table 6.1: Means and Standard Deviations for Tenth Grade Math Test Scores and Test Score Gains, by context**

| | Urban | | Suburb | | Rural | |
|---|---|---|---|---|---|---|
| **Dependent measures** | **Mean** | **S.D.** | **Mean** | **S.D.** | **Mean** | **S.D.** |
| Gr. 10 Math scores | 35.77 [SR] | 11.89 | 38.75 [U] | 11.85 | 38.66 [U] | 11.21 |
| Test Score gains | 9.73 [S] | 6.93 | 10.11 [RU] | 7.17 | 9.54 [S] | 7.07 |
| *N* | 2,320 | | 4,740 | | 2,260 | |

**Note:** $N = 9{,}320$

Superscript R–mean is significantly different from mean for rural students at $p < 0.05$.

Superscript U–mean is significantly different from mean for urban students at $p < 0.05$.

Superscript S–mean is significantly different from mean for suburban students at $p < 0.05$.

**Table 6.2: Means and Standard Deviations, by test score categories**

| | Low Test | | Med Test | | High Test | |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD |
| **Extracurriculum** | | | | | | |
| Problem Behavior | 0.101 MH | 0.728 | -0.086 HL | 0.514 | -0.213 ML | 0.365 |
| Activity Involvement | 0.681 MH | 1.116 | 0.973 HL | 1.264 | 1.544 ML | 1.479 |
| Sports Involvement | 0.738 H | 1.310 | 0.699 | 1.105 | 0.656 L | 1.030 |
| **Noncognitive Resources** | | | | | | |
| Technological Capital | -0.349 MH | 1.159 | 0.056 HL | 0.839 | 0.280 ML | 0.501 |
| Parental Aspirations | 0.590 MH | 0.492 | 0.796 HL | 0.403 | 0.938 ML | 0.240 |
| Parent-Child Social Capital | -0.042 M | 0.620 | 0.011 L | 0.578 | -0.016 | 0.537 |
| Intergenerational Closure | -0.128 MH | 0.737 | -0.010 HL | 0.741 | 0.082 ML | 0.732 |
| Peer Social Capital | -0.047 H | 0.891 | -0.002 H | 0.791 | 0.068 ML | 0.759 |
| **Distance to nearest college** | | | | | | |
| Distance | 6.533 M | 9.511 | 7.259 HL | 11.636 | 6.011 M | 8.520 |
| **Aspirations/Achievement** | | | | | | |
| College-Going Aspirations | 0.843 MH | 0.364 | 0.964 HL | 0.187 | 0.993 ML | 0.085 |
| **Individual Controls** | | | | | | |
| Female | 0.526 MH | 0.499 | 0.490 HL | 0.500 | 0.446 ML | 0.497 |
| White | 0.370 MH | 0.483 | 0.592 HL | 0.492 | 0.689 ML | 0.463 |
| Black | 0.235 MH | 0.424 | 0.099 HL | 0.299 | 0.021 ML | 0.142 |
| Hispanic | 0.227 MH | 0.419 | 0.116 HL | 0.320 | 0.050 ML | 0.217 |
| Asian | 0.076 MH | 0.265 | 0.095 HL | 0.293 | 0.176 ML | 0.381 |
| Socioeconomic status | -0.360 MH | 0.645 | 0.018 HL | 0.677 | 0.439 ML | 0.659 |
| Two-parent | 0.701 MH | 0.458 | 0.787 HL | 0.409 | 0.846 ML | 0.361 |
| Number of siblings | 2.719 MH | 1.684 | 2.214 HL | 1.473 | 1.970 ML | 1.329 |
| Mobility | 1.340 MH | 1.501 | 1.163 HL | 1.479 | 1.013 ML | 1.335 |
| South | 0.379 H | 0.485 | 0.387 H | 0.487 | 0.320 ML | 0.467 |
| **School Controls** | | | | | | |
| Percent Minority | 45.419 MH | 33.418 | 32.902 HL | 30.348 | 27.687 ML | 27.045 |
| Student/Teacher ratio | 17.672 MH | 4.088 | 17.110 HL | 3.806 | 17.340 ML | 3.979 |
| School Poverty | 29.181 MH | 19.265 | 20.813 HL | 16.241 | 14.724 ML | 12.892 |
| % FT Certified Teachers | 96.013 MH | 10.957 | 96.928 HL | 10.918 | 97.566 ML | 10.222 |
| % College Prep | 51.682 MH | 31.546 | 56.648 HL | 30.571 | 64.864 ML | 29.867 |
| % Vocational | 19.758 MH | 21.888 | 17.810 HL | 20.893 | 15.609 ML | 19.113 |

**Note:** Superscript M–mean is significantly different from mean for Middle scoring students at $p < 0.05$.
Superscript H–mean is significantly different from mean for High scoring students at $p < 0.05$.
Superscript L–mean is significantly different from mean for Low scoring students at $p < 0.05$.

**Table 6.3: Pooled Analysis of Tenth Grade Math Achievement and Math Test Score Gains**

| | Tenth Grade Math Achievement | | | Test Score Gains | | |
|---|---|---|---|---|---|---|
| | $\beta$ | S.E. | | $\beta$ | S.E. | |
| **Spatial Context** | | | | | | |
| Urban | -0.575 | 0.455 | | 0.179 | 0.266 | |
| Suburb | -0.009 | 0.334 | | 0.177 | 0.212 | |
| **Extracurriculum** | | | | | | |
| Problem Behavior | -1.724 | 0.189 | *** | -1.092 | 0.139 | *** |
| Activity Involvement | 1.078 | 0.096 | *** | 0.496 | 0.063 | *** |
| Sports Involvement | -0.407 | 0.099 | *** | -0.181 | 0.076 | * |
| **Noncognitive Resources** | | | | | | |
| Technological Capital | 0.788 | 0.123 | *** | 0.248 | 0.079 | ** |
| Parental Aspirations | 5.423 | 0.296 | *** | 1.548 | 0.260 | *** |
| Intergenerational Closure | 0.488 | 0.144 | ** | 0.294 | 0.110 | ** |
| Parent-Child Social Capital | -1.786 | 0.198 | *** | -0.735 | 0.142 | *** |
| Peer Social Capital | -0.396 | 0.146 | ** | -0.118 | 0.101 | |
| **Distance to nearest college** | | | | | | |
| Distance | 0.013 | 0.013 | | 0.004 | 0.008 | |
| **Aspirations** | | | | | | |
| College-Going Aspirations | 5.861 | 0.511 | *** | 0.967 | 0.241 | *** |
| **Individual Controls** | | | | | | |
| Female | -2.509 | 0.217 | *** | -1.178 | 0.147 | *** |
| Hispanic | -3.604 | 0.395 | *** | -0.206 | 0.260 | |
| Black | -6.168 | 0.390 | *** | -0.604 | 0.244 | * |
| Asian | 0.670 | 0.525 | | 1.348 | 0.323 | *** |
| Socioeconomic status | 3.026 | 0.187 | *** | 1.054 | 0.132 | *** |
| South | 0.666 | 0.326 | * | -0.110 | 0.179 | |
| Two-parent | 0.174 | 0.244 | | 0.138 | 0.174 | |
| Number of siblings | -0.360 | 0.072 | *** | -0.119 | 0.051 | * |
| Mobility | -0.366 | 0.074 | *** | -0.086 | 0.051 | + |
| **School Controls** | | | | | | |
| Percent Minority | -0.008 | 0.009 | | 0.005 | 0.004 | |
| Student/Teacher ratio | -0.021 | 0.041 | | 0.028 | 0.024 | |
| School Poverty | -0.062 | 0.014 | *** | -0.024 | 0.007 | *** |
| % FT Certified Teachers | -0.009 | 0.019 | | -0.006 | 0.008 | |
| % College Prep | 0.010 | 0.005 | * | 0.007 | 0.003 | * |
| % Vocational | -0.011 | 0.009 | | -0.002 | 0.004 | |
| ***Constant*** | 35.210 | 2.016 | *** | 8.362 | 1.041 | *** |

**Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$**

$N = 9,320$

**Table 6.4: OLS Regression Results for Contextual Analysis of Tenth Grade Math Achievement**

| | Urban (*N* = 2,320) | | Suburb (*N* = 4,740) | | Rural (*N* = 2,250) | |
|---|---|---|---|---|---|---|
| | *β* | S.E. | *β* | S.E. | *β* | S.E. |
| **Extracurriculum** | | | | | | |
| Problem Behavior | -0.866 | 0.327 * | -2.173 | 0.272 *** | -1.846 | 0.365 *** |
| Activity Involvement | 0.973 | 0.181 *** | 1.000 | 0.139 *** | 1.305 | 0.165 *** |
| Sport Involvement | -0.617 | 0.171 ** | -0.490 | 0.154 ** | -0.274 | 0.174 |
| **Noncognitive Resources** | | | | | | |
| Technological Capital | 0.855 | 0.217 *** | 0.807 | 0.188 *** | 0.720 | 0.260 ** |
| Parental Aspirations | 5.042 | 0.610 *** | 5.233 | 0.430 *** | 6.046 | 0.579 *** |
| Intergenerational Closure | 0.130 | 0.316 | 0.716 | 0.209 ** | 0.403 | 0.313 |
| Parent-Child Social Capital | -1.897 | 0.324 *** | -1.702 | 0.294 *** | -1.853 | 0.449 *** |
| Peer Social Capital | -0.315 | 0.293 | -0.367 | 0.199 + | -0.607 | 0.374 |
| **Distance to nearest college** | | | | | | |
| Distance | 0.075 | 0.093 | -0.016 | 0.010 | 0.072 | 0.023 ** |
| **Aspirations** | | | | | | |
| College-Going Aspirations | 5.727 | 0.714 *** | 4.492 | 0.502 *** | 5.114 | 0.658 *** |
| **Individual Controls** | | | | | | |
| Female | -2.589 | 0.428 *** | -2.380 | 0.312 *** | -2.870 | 0.416 *** |
| Hispanic | -2.093 | 0.690 ** | -4.310 | 0.596 *** | -4.101 | 0.838 *** |
| Black | -4.943 | 0.672 *** | -6.676 | 0.545 *** | -6.020 | 0.885 *** |
| Asian | 1.315 | 0.877 | 1.016 | 0.740 | -1.272 | 1.175 |
| Socioeconomic status | 2.799 | 0.357 *** | 3.142 | 0.261 *** | 2.932 | 0.369 *** |
| South | 2.092 | 0.709 ** | 0.684 | 0.424 | -0.861 | 0.626 |
| Two-parent | 0.375 | 0.485 | 0.093 | 0.339 | -0.129 | 0.533 |
| Number of siblings | -0.438 | 0.138 ** | -0.412 | 0.104 *** | -0.173 | 0.147 |
| Mobility | -0.525 | 0.177 ** | -0.261 | 0.123 * | -0.371 | 0.145 * |
| **School Controls** | | | | | | |
| Percent Minority | **-0.030** | **0.017** + | **-0.003** | **0.012** | **0.015** | **0.015** |
| Student/Teacher ratio | 0.017 | 0.102 | -0.012 | 0.057 | 0.012 | 0.072 |
| School Poverty | **-0.076** | **0.027** ** | **-0.055** | **0.018** ** | **-0.071** | **0.026** ** |
| % FT Certified Teachers | -0.031 | 0.032 | 0.017 | 0.015 | -0.025 | 0.020 |
| % College Prep | **0.018** | **0.010** + | **0.007** | **0.006** | **0.000** | **0.009** |
| % Vocational | **-0.004** | **0.024** | **-0.019** | **0.009** + | **-0.010** | **0.010** |
| ***Constant*** | 35.823 | 3.888 *** | 33.464 | 1.882 *** | 35.637 | 2.685 *** |

**Note:** Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Bold coefficients significantly different from other spatial contexts at $p < 0.05$ level

**Table 6.5: OLS Regression Results for Contextual Analysis of Math Test Score Gains**

| | Urban ($N$ = 2,320) | | | Suburb ($N$ = 4,740) | | | Rural ($N$ = 2,250) | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | S.E. | | $\beta$ | S.E. | | $\beta$ | S.E. | |
| **Extracurriculum** | | | | | | | | | |
| Problem Behavior | -0.640 | 0.245 | * | -1.329 | 0.229 | *** | -1.149 | 0.257 | *** |
| Activity Involvement | 0.576 | 0.127 | *** | 0.500 | 0.089 | *** | 0.426 | 0.126 | ** |
| Sports Involvement | -0.244 | 0.146 | | -0.200 | 0.108 | + | -0.081 | 0.149 | |
| **Noncognitive Resources** | | | | | | | | | |
| Technological Capital | 0.486 | 0.148 | ** | 0.181 | 0.128 | | 0.111 | 0.189 | |
| Parental Aspirations | 1.578 | 0.437 | ** | 1.921 | 0.348 | *** | 0.763 | 0.443 | + |
| Intergenerational Closure | 0.156 | 0.195 | | 0.478 | 0.159 | ** | 0.053 | 0.254 | |
| Parent-Child Social Capital | -0.637 | 0.286 | * | -0.954 | 0.206 | *** | -0.466 | 0.296 | |
| Peer Social Capital | -0.201 | 0.227 | | -0.039 | 0.154 | | -0.274 | 0.248 | |
| **Distance to nearest college** | | | | | | | | | |
| Distance | 0.128 | **0.041** | ** | **-0.007** | **0.007** | | **0.031** | **0.015** | * |
| **Aspirations** | | | | | | | | | |
| College-Going Aspirations | 0.556 | 0.496 | | 0.945 | 0.306 | ** | 1.466 | 0.495 | ** |
| **Individual Factors** | | | | | | | | | |
| Female | -1.316 | 0.273 | *** | -0.878 | 0.207 | *** | -1.599 | 0.326 | *** |
| Hispanic | -0.736 | 0.476 | | 0.074 | 0.375 | | -0.401 | 0.699 | |
| Black | -0.540 | 0.438 | | -0.529 | 0.372 | | -1.146 | 0.538 | * |
| Asian | 0.742 | 0.520 | | 1.642 | 0.475 | ** | 1.636 | 0.915 | + |
| Socioeconomic status | 0.754 | 0.246 | ** | 1.106 | 0.194 | *** | 1.131 | 0.276 | *** |
| South | 0.316 | 0.367 | | -0.310 | 0.254 | | -0.298 | 0.362 | |
| Two-parent | 0.500 | 0.336 | | -0.050 | 0.257 | | 0.178 | 0.351 | |
| Number of siblings | -0.100 | 0.093 | | -0.056 | 0.075 | | -0.249 | 0.116 | * |
| Mobility | -0.099 | 0.110 | | -0.149 | 0.075 | * | 0.048 | 0.110 | |
| **School Factors** | | | | | | | | | |
| Percent Minority | **0.001** | **0.009** | | **-0.003** | **0.006** | | **0.022** | **0.009** | * |
| Student/Teacher ratio | -0.007 | 0.055 | | 0.064 | 0.033 | + | 0.022 | 0.049 | |
| School Poverty | **-0.018** | **0.016** | | **-0.015** | **0.008** | + | **-0.041** | **0.016** | ** |
| % FT Certified Teachers | 0.002 | 0.014 | | -0.014 | 0.010 | | -0.015 | 0.012 | |
| % College Prep | **0.009** | **0.006** | | **0.010** | **0.004** | * | **0.000** | **0.006** | |
| % Vocational | 0.002 | 0.007 | | -0.007 | 0.005 | | 0.001 | 0.009 | |
| ***Constant*** | 8.196 | 2.206 | *** | 8.390 | 1.260 | *** | 9.976 | 1.523 | *** |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Bold coefficients significantly different from other spatial contexts at p < 0.05 level

# CHAPTER 7: LIKELIHOOD OF COLLEGE ATTENDANCE

## 7.1 Introduction

The central consideration of this project is spatial variation in predictors of the likelihood of college attendance. In the last three chapters, I analyzed students' noncognitive resources, students' college-going aspirations, and students' math achievement before turning to the likelihood of college attendance. Attending college is the result of a complex application process that includes fostering an affinity towards post-secondary education (Reynolds et al. 2006) and doing the necessary research to find a good match for school (Hill 2008; Klasik 2012; McDonough 1997), all the while building resources like engagement with extracurricular clubs and teams, avoiding engagement with problem behavior and ultimately, doing well academically in school. Students, sometimes with their families, negotiate the college application process by exploring their available options, packaging their accomplishments, and hoping for that acceptance letter. If students are able to negotiate the college application process, their likelihood of actual college attendance is greater (Klasik 2012), but each step in the process tests a student's dedication and interest in furthering their education.

Our understanding of the process of college attendance is mostly limited to students attending traditional, four-year institutions (Bozick and DeLuca 2005; Goldrick-Rab 2006; Sandefur et al. 2006). While there is some research that considers pathways to two-year or vocational post-secondary training (Alexander et al. 2008; Stephan et al. 2009), this area remains under-developed regarding the differences across spatial contexts. In terms of stratification along race/ethnic or social class lines, the existing sociological scholarship has focused largely

on traditional and elite four-year institutions. While these institutions represent the most competitive options in the larger post-secondary landscape, they are not necessarily representative of the options available broadly to students across the country or to students in different spatial contexts. That is to say, many of these institutions are located in either suburban or urban settings, leaving rural students with less exposure to this style of post-secondary education (Turley 2009). In this literature, scholars argue that even when students from traditionally disadvantaged race/ethnic groups or lower socioeconomic status are admitted to an elite college or university, these students may struggle to finish their degrees because they find adjusting to everyday college life to be at odds with their community or family life at home (Aries 2008; Espenshade and Radford 2009; Stuber 2011). Arguments of a cultural mismatch between race/ethnic or social class minorities and collegiate culture dominate this scholarship (Stuber 2011). This line of inquiry assumes that the race/ethnic or social class experience of individuals is the same regardless of spatial context. As such, I argue that these sociodemographic characteristics combined with other factors predict the likelihood of college attendance differentially depending on spatial context. In this chapter, I address the final research question: *what are the contextual differences in the way noncognitive resources (combined with other factors), students' college-going aspirations and high school math achievement affect two-year and four-year college attendance?* I extend the existing literature by examining both the variation in the likelihood of college attendance across contexts, but also the way traditional predictors of college attendance vary within each of three spatial contexts. The complexities of the college attendance process and the nuances of spatial context situate the present analysis to add to the literature.

In the sociology of higher education scholarship, it is evident that students in different spatial contexts face unique challenges related to college attendance. The first issue students face is distance to the nearest institution. Turley (2009) combines data from National Education Longitudinal Study (NELS) and the Integrated Post-Secondary Education Data System (IPEDS) and shows that greater distance to the nearest post-secondary institution decreases the likelihood of applying to college. Students at the greatest distance are also at the greatest disadvantage in terms of applying to college. A second issue facing students that varies across context is the kind and quality of local social networks. In rural contexts, the relationship between students and their families or communities may deter students from leaving (Johnson et al. 2005). The social capital that rural students develop in the context of their local community may serve to keep them local rather than facilitate their leaving to find other post-secondary opportunities. A final issue facing students that varies across contexts is the availability of resources outside the family to support students' application to college. In rural contexts, schools and communities invest the lion share of their resources in the most academically capable students (Carr and Kefalas 2009). When schools have the resources or social networks to provide support for students, they focus their energy on the students they feel most capable of persisting through higher education. Scholars often characterize the urban public school as particularly challenged in helping urban students manage the transition from high school to college because of cultural barriers related to race/ethnicity or social class (or both) (Farmer-Hinton 2011; Roderick et al. 2011). Though studies of achievement rarely compare students across multiple spatial contexts, there are a limited number of studies of college access or college life addressing more than the urban/non-urban or rural/non-rural, but the role of spatial context is tangential to their findings (Engberg and Wolniak 2010; Sandefur et al. 2006).

In this chapter, I conduct a two-pronged analysis. First, I consider college attendance broadly, lumping two-year and four-year attendance together as other scholars have done in the existing literature. I examine the likelihood of college attendance in a set of nested models for the pooled sample of public school students. Then I conduct a contextual analysis of the same outcome for students in urban, suburban and rural places. While a broad segment of the sample fosters college-going aspirations, applying to and enrolling in a post-secondary institution represents a level of tenacity above and beyond the typical student.

In a second set of models, I examine students' likelihood of college attendance with greater specificity. In this analysis, I create a categorical measure of college attendance that includes no enrollment, two-year enrollment and four-year enrollment. In a set of nested multinomial logistic regression models, I simultaneously analyze the likelihood of two-year enrollment compared with non-enrollment and the likelihood of four-year enrollment versus non-enrollment to understand if the same factors are related to college attendance. In these models, I am able to show if the traditional explanations of college attendance hold true for attendance at more than the conventional, four-year college. After I estimate the nested models for the pooled sample of students, I estimate separate contextual models for urban, suburban and rural students. In contextual analyses, I explore how the traditional predictors of college attendance vary depending on the spatial context and the institutional type.

In this chapter, I have two overarching goals. First, I explore how engagement with extracurriculum in concert with individual and school factors affects the likelihood of college enrollment. The analysis in this chapter combines measures from the past three chapters (parental aspirations, technological capital, social capital, college-going aspirations, and math achievement) to understand how students' engagement with post-secondary education varies

across urban, suburban and rural contexts. Then, I compare the likelihood of either two-year or four-year enrollment with no college enrollment. By focusing on likelihood of enrollment in different institutional types, I recognize that not all post-secondary credentials are created equal. Though the higher education landscape is quite diverse, the existing scholarship is limited to examining whether students enroll in a traditional, four-year institution. I try to understand the factors that affect the likelihood of enrollment broadly as well as the likelihood of enrollment in either a two-year or four-year institution. Higher education enrollment statistics are often presented in a general sense, lumping two-year and four-year students together, obscuring the complexities of post-secondary education (Snyder and Dillow 2011). This chapter stands to add to the collective sociology of higher education knowledge as well as research on stratification, recognizing spatial context as a crucial factor.

**7.2 Measures**

In this chapter, I analyze the likelihood of college attendance using two measures. The first is a simple measure of general college attendance. This measure approximates whether students attend *any* post-secondary institution. I construct the dependent measure in this analysis using the third wave of ELS data collected in 2006, four years students' initial responses in the tenth grade. The NCES coded sample members' transcripts for the "highest level of education attempted." The distribution for this six-category measure appears in Appendix D and captures a range of responses from non-graduation through four-year enrollment. To create the measure, I recoded students' responses to the highest level of education attempted, including matriculation at either a two-year or four-year institution. This measure compares students attending two-year *and* four-year institutions with non-enrollees.

Lumping together post-secondary outcomes or ignoring enrollment in two-year colleges altogether is commonplace in the literature. The second dependent measure in this analysis adds to our limited knowledge of institutional type and college enrollment. In the second phase of the analysis, I compare the likelihood of enrollment in either a two-year *or* a four-year school with non-enrollment. To construct this second measure, I have recoded students in the sample reporting their highest level of education attempted into three categories: no enrollment, two-year enrollment, and four-year enrollment. Students in the *non-enrollment* group reported "some high school," "GED," "High School Diploma" or enrollment in a "Less than two-year school." Those students enrolled in a two-year institution were recoded as *two-year enrollment*. Those students reporting four-year enrollment were recorded as *four-year enrollment*. The distribution of this measure appears in Table 7.1.

There are a few limitations with the current dependent measures. The data measures student responses to their highest level of education attempted two years after high school graduation. As such, I cannot account for students who take time away from their education and subsequently enroll in a post-secondary institution more than two years after their high school graduation. Additionally, both the general college attendance and trichotomous measure of college attendance assume a straight-line trajectory from high school to some post-secondary institution. Therefore, I do not capture students who attend a two-year *and* four-year institution in the span of this two-year period. Even though these other scenarios represent possibilities for students' post-secondary outcomes, I am confident that the current measurement captures a broad possibility of student outcomes.

In addition to the dependent variables, I include several key independent variables in the nested models described below. The summary statistics for the key independent and control

measures appear in Table 7.2. I capture students' extracurricular activities with three variables: problem behavior, engagement with extracurricular clubs, and involvement with athletics. These three variables approximate students' affinity for or engagement in school life. I measure technological capital using a composite measure of students' access to a computer and to the Internet. I assess social capital using composite scales for intergenerational closure, parent-child social capital and peer social capital. I describe these measures in detail in Chapter 4. I am able to include a measure of distance to the nearest post-secondary institution. Finally, I include three measures of students' college-going aspirations and achievement. Students' aspirations come from their response to the highest level of education they believe they'll attempt in the future. I bring in student achievement using tenth grade math test scores and test score gains in math achievement from tenth to twelfth grade.

This analysis includes traditional control measures for individual student and school factors. To account for individual differences in the likelihood of college attendance, I control for students' gender, race/ethnicity, socioeconomic status, whether students live in the South, whether students live in a two-parent home, whether their families have many siblings and if they have moved in the past six months. To account for variation based on school factors, I control for schools' percentage of minority students, the student/teacher ratio, the percentage of students receiving free or reduced-price lunch (as a proxy for school poverty), the percentage of full-time certified teachers, and the percentage of students enrolled in college-preparatory courses and the percentage of enrollment in vocational/technical courses.

## 7.3 Methods

In this chapter, I employ a similar analytical strategy to earlier chapters using different methodological techniques. The likelihood of general college attendance is a dichotomous measure, so I use logistic regression in the analysis to compare those attending college with non-enrollees. The second dependent measure represents three mutually exclusive outcomes for students. Because these measures represent three unique outcomes and because students may belong to only one category at a time, multinomial logistic modeling is the most appropriate method of analysis. The reference category in the multinomial logit analysis is "no enrollment."

The strategy for the logistic regression and multinomial logistic regression modeling is the same. For both dependent outcomes, I estimate five nested models for the pooled sample of public school students. In the first of these pooled models, I include the dummy measures of spatial context comparing urban and suburban students to rural students. This model illustrates basic differences across spatial contexts. In Model 2, I add measures of engagement with the extracurriculum, technological capital, parental aspirations, and social capital. I also introduce the measure of distance to nearest college in this second model. In Model 3, I incorporate the measures of college-going aspirations, students' tenth grade math achievement, and their test score gains. Models 2 and 3 illustrate the factors impacting the likelihood of college enrollment outside of demographic characteristics. In Model 4, I control for individual characteristics, including gender, race/ethnicity, socioeconomic status, region, and family structure. And in Model 5, I control for school characteristics, including the percentage of minority enrollment, the percentage of students receiving free or reduced-price lunch, percentage of students enrolled in either college-preparatory or vocational classes, among others. For the sake of clarity, I present

the full logistic model (Model 5) in Table 7.3 and the full MNLM models (Model 5) in Table 7.5 for the present discussion.

In the second phase of the analysis, I evaluate how different factors affect the likelihood of post-secondary enrollment for each spatial context. Follow the modeling logic described above, I estimate nested logistic and multinomial logit models for urban, suburban and rural students separately.[26] For ease of discussion, I present the contextual analysis of general college enrollment in Table 7.4 and the contextual multinomial logit models in Table 7.6.

In these analyses, I restrict the sample to public school students, including traditional neighborhood schools and public schools of choice. I do not control further for school type.[27] I further restrict the sample to schools with at least five or more respondents. The final number of students included in this analysis is 9,910.

### 7.4 Sample Characteristics

Before delving into the regression models, I first review some descriptive characteristics of the sample. In Table 7.2, I present descriptive statistics for non-enrollees, two-year enrollees and four-year enrollees. In Chapter 5, we saw close to 80 percent of the sample aspired to attend some form of post-secondary education. Approximately 60 percent of the students in the overall sample are enrolled in some form of higher education.[28] This is consistent with immediate high

[26] In Model 1, I include measures of extracurricular engagement, noncognitive resources and distance. In Model 2, I add measures of students' college-going aspirations, math achievement, and math test score gains. In Model 3, I control for individual student characteristics. In Model 4, I control for school characteristics.

[27] The number of students in public schools of choice does not represent a sufficient comparison in each spatial context to include controls.

[28] Students report their highest level of education obtained two years after they graduate from high school. It is not possible to tell whether students transition directly after high school of whether they have a gap year. There is also no way to tell whether they spend a year at a two-year college before transferring to a four-year institution.

school graduates enrollment rates for the larger population (Aud et al. 2012). Forty-one percent of students enroll in four-year institutions compared to 26 percent of students who enroll in two-year institutions.

Looking more closely at each of the college attendance categories, there is a clear profile of the students enrolled in four-year institutions. Over half of the students enrolled in four-year institutions hail from suburban contexts. Twenty-six percent of students attending four-year institutions are originally from urban areas and twenty-two percent call rural contexts home. Four-year students exhibit the least problem behavior and have the highest engagement with the extracurriculum as high school students, compared to students enrolled in two-year schools or non-enrollees. Students attending four-year institutions have the greatest levels of noncognitive resources and live within six miles of the nearest post-secondary institution. Ninety-nine percent of four-year college students reported having college-going aspirations. These students have the highest reported math achievement and the greatest test score gains when compared with their peers enrolled at two-year schools or with non-enrolled peers.

There are consistent patterns for this four-year college student among demographic indicators as well. Students attending traditional, four-year institutions are more likely to live in a two-parent home and have fewer siblings. These students experience greater residential stability, having moved fewer times. These students come from a high socioeconomic status, compared to the average SES of students enrolled in a two-year school or not enrolled at all. Students attending four-year institutions hail from secondary schools that share some common factors. These students attend schools with fewer students receiving free or reduced-price lunches. Their high schools have the largest proportion of students enrolled in college-

preparatory courses and the smallest proportion enrolled in vocational/technical courses. The student to teacher ratio is roughly the same for all three categories of enrollment.

This descriptive picture confirms much of the scholarly and popular conception of students who are advantaged in a number of ways. In the following analysis, I assess the impact of these advantages on the conventional measure of college attendance that lumps two-year and four-year attendance together. In Section 7.6, I explore the complexities of factors affecting students' attendance at either a four-year or a two-year compared to non-enrollees.

## 7.5: Logistic Regression results: Likelihood of general college attendance

### *7.5.1 Likelihood of General College Attendance: Pooled Analysis*

In the first phase of this analysis, I examine general college attendance. I present five nested models examining the likelihood of college attendance in Table 7.3. In these pooled models, I regress the likelihood of college enrollment for public schools students. I include dummy variables for urban and suburban students, using rural students as the reference group in the first model and add independent predictors in blocks, including engagement with the extracurriculum, noncognitive resources (parental aspirations, technological capital and social capital), students' college-going aspirations and achievement, before controlling for individual and school characteristics.

Beginning in Model 1, I examine spatial differences in all five models and show no significant differences in the likelihood of college attendance across spatial context. Though there do not appear to be significant differences for this dependent measure, the purpose of this chapter is to confirm whether the pooled and contextual models present a similar or contrasting conception of the likelihood of college attendance.

Turning to the significant predictors in the models, many of the same relationships present in earlier analyses are important for understanding the likelihood of college attendance. Students' with increasingly greater engagement with problem behavior are over thirty percent less likely to attend college. Engagement with the extracurriculum, including both clubs and sports, is a significant predictor of students' attending college. In previous analyses, the impact of participation with sports has varied, but here, students' increased involvement in athletics is associated with a greater likelihood of attending college even after controlling for individual and school related factors.

Students' noncognitive resources are universally positively and significantly related to the likelihood of college attendance. The measure of technological capital is unique to analyses of college enrollment and in this model, we see that it is a relevant predictor of attending a post-secondary institution. Students whose parents have college-going aspirations are more likely to attend a post-secondary institution. While this finding is evident in the literature, it is unclear whether it is true in all spatial contexts or if it is true for all institutional types. By lumping together college attendance outcomes for the public school students in the sample, I obscure potential nuances in the way these relationships work, but will be able to show explore these issues in the next phase of the analysis. In these models I include the measure of distance to nearest post-secondary institution and find a slightly significant and negative relationship. That is, as students' distance to the nearest institution increases, their likelihood of attending any institution decreases. This finding is expected and confirms Turley's (2009) earlier conclusions regarding the relevance of distance.

Finally, students' own secondary school experiences are critical predictors of their likelihood of college attendance. Students with college-going aspirations are more likely than

their non-aspirant peers to enroll in a post-secondary institution. However, the odds of their enrollment decrease slightly once I control for individual and school factors. Students' math achievement and test score gains are both important predictors of the likelihood of attending college. Considering students must demonstrate preparedness for college-level work on their college application, this finding is expected.

Controlling for individual characteristics yielded mostly expected findings with a few exceptions. Students from racial/ethnic minority groups are more likely than their white peers to attend a post-secondary institution. Asian students have the greatest likelihood of attending higher education compared with their white peers. Black and Hispanic students are also more likely to attend a post-secondary institution compared with their white peers. This last finding is not necessarily expected considering the literature characterizes the admissions process as troubling to students from traditionally under-represented minority groups (Espenshade and Radford 2009; Stevens 2007). As in all analyses in this project, as students' socioeconomic status increases, so does the likelihood of their college attendance. Living in a two-parent home, one proxy for family structure, is not significantly related to the likelihood of college attendance. This runs counter to some scholarship where importance of parents as a support system and as a source of information for students applying to college is evident (McDonough 1997).

Few school characteristics are related to increased likelihood of college attendance. This finding is surprising considering that school resources are an important consideration for understanding why some students pursue higher education and others do not. It could also be the case that the individual and family factors controlled for in this analysis explain these differences. To check this explanation, I conducted a supplementary analysis of the trichotomous measure of college enrollment and school factors. In multinomial logistic

regression models including only these school factors, I find positive coefficients for percentage of minority enrollment and percentage enrolled in college preparatory courses for four-year enrollment (compared with non-enrollees). I also find negative coefficients for student/teacher ratios, school poverty and percentage enrolled in vocational/technical classes.

In these models, we get a general sense of the predictors associated with greater likelihood of college attendance. This analysis of public school students does not offer groundbreaking results, but it does provide confirmation of suspected relationships. Most notable among these findings is the lack of significance for the two-parent family measure or for school characteristics (with the exception of percentage minority student enrollment). In the literature, families and schools offer important supports for persisting through high school and in the preparation for and application to colleges, regardless of institutional type (Dyk and Wilson 1999; Israel et al. 2001; Teachman 1987). To find little significance between these measures is perplexing, but perhaps this means that we have discounted the importance of individual attributes (demography) and accomplishments (dossier of activities, grades).

The findings in the pooled models confirm much of what we know about the kind of students who attend post-secondary institutions. They are students who engage with their schools' extracurricular offerings, who excel academically, and who aspire towards a post-secondary education. These students also have noncognitive resources that augment their chances of attending college including supportive social networks, parents who engage in their lives and who foster high aspirations for them, and peers who buy into the rewards of education. These models do extend some of what we know, though. With the inclusion of technological capital and distance to nearest institution, we see that exposure to college is important for predicting likelihood of attending college. Students' access to technological capital increases

their likelihood of enrolling in a post-secondary institution. Greater distance from the nearest institution is associated with lowered likelihood of attending. These two measures represent new dimensions of stratification of student outcomes previously overlooked.

### *7.5.2 Likelihood of General College Attendance: Contextual Analysis*

In Table 7.4, I introduce a contextual analysis of the likelihood of college attendance. In these models, I examine how these predictors vary within urban, suburban and rural contexts. While some of the expectations around the prototypical students are confirmed in the pooled models, there are findings in the contextual models that cast some doubt that this student manifests him or herself in the same way in every spatial context. Depending on the spatial context, some factors matter for predicting the likelihood of college attendance and others do not.

In these contextual models, there is some consistency with the pooled models. Students engaging with the extracurriculum and avoiding delinquency are universally more likely to attend college, no matter the spatial context. Students involved in more school clubs, no matter the spatial location of those schools, are more likely to attend college. As in the pooled models, access to technological capital is significantly related to the likelihood of college attendance for students in all three spatial contexts. Parents' college-going aspirations are also positively related to students' likelihood of attending college in all three contexts. These two measures are based out of the home and confirm the importance of factors in the home for reinforcing and fostering positive views of post-secondary education for students. In additional to engagement with school clubs and access to technological capital, students that foster college-going aspirations and high achieving students are more likely to attend college regardless of context.

These measures are the only common predictors of the likelihood of college attendance across all three spatial contexts.

There were several disparities in significance between the pooled and contextual models in this analysis. Involvement with sports teams predicts the likelihood of attending college for rural students. Students involved in more sports activities are twenty percent more likely to attend college, net of other factors. For rural students, greater intergenerational closure positively predicts greater likelihood of college attendance. Two of the social capital measures: parent-child social capital and peer social capital are positive and significant predictors of suburban students' likelihood of college attendance. Both of these resources are representative of interpersonal relationships students build with either their parents or their peers. These kinds of resources are relevant for predicting the likelihood of attending college only for suburban students. Having close personal connections may be happening in urban or rural places, but these connections are not increasing the likelihood of attending college for these students. Additionally, the distance measure is only significantly and negatively related to the likelihood of college attendance for suburban students. Family factors predicted variation in suburban students' likelihood of attending college. Suburban students with more siblings or students with greater residential mobility were less likely to attend a post-secondary institution.

With the exception of intergenerational closure, most of the significant differences in these contextual models indicate that the model itself predicts suburban college attendance well.[29] Many of the traditional explanations for educational stratification do not apply to

[29] In a supplementary analysis using more crudely imputed data where I produce fit statistics, I see that the model fit for the urban model (Pseudo-$R^2$ = 0.284), the suburban model (Pseudo-$R^2$ = 0.298), and the rural model (Pseudo-$R^2$ = 0.274) are relatively similar. If the model fit is similar then perhaps there may be other factors missing from the model to explain the likelihood of college attendance in either an urban or a rural context.

understanding college attendance in either urban or rural places. In the existing literature, it is often assumed that urban and rural contexts remain at a disadvantage when compared with suburban contexts, especially regarding education outcomes. However, in earlier analyses, it was not necessarily evident that either urban or rural students stood at a serious disadvantage regarding the necessary resources for pursuit of post-secondary education when compared with suburban students. The social resources and the family structure that we typically think of as important are not relevant in either urban or rural places for understanding the likelihood of attending college. Surprisingly, the other measures of social capital and distance are unrelated to the likelihood of college attendance for urban students. For urban students, the other noncognitive measures are unrelated to the likelihood of college attendance. While many of these factors have been proven statistically related to other secondary school outcomes like achievement and attainment, there is little evidence of how these factors impact enrollment in college.

## 7.6 Multinomial Logistic Regression Results: Likelihood of College Attendance

### *7.6.1 Pooled Multinomial Logistic Regression Analysis*

I present the multinomial logistic regression analysis of the pooled sample of public school students in Table 7.5. In the columns labeled Two-Year vs. No College, I compare the likelihood of two-year enrollment and non-enrollment. In the columns labeled Four-Year vs. No College, I compare the likelihood of four-year enrollment and non-enrollment. For ease of comparison, I present these columns side by side to understand the impact of independent

variables for each institutional type. I include a column for the raw coefficients and the odds ratios.[30]

Despite some similarities in effects for rural and urban students in the last set of pooled models, in this model, we see urban students maintain an advantage over rural students in the likelihood of four-year enrollment compared with non-enrollees. Urban students are thirty-five percent more likely than their rural peers to pursue a four-year education. Urban students are twenty percent less likely to enroll in a two-year institution compared with their rural peers. The significance of the measure for urban students justifies the further focus on context in the spatial models presented later.

Beyond spatial differences, students attending either a two-year or four-year school are similar in a few ways. These students report less problem behavior and are more engaged in club activities in high school. A one unit increase in the problem behavior measure means that students are fifty percent less likely to enroll in a four-year school and twenty-five percent less likely to enroll in a two-year school (compared in both cases with non-enrollees). Students with greater athletic engagement are more likely to attend a four-year institution.

As in other models, noncognitive resources are nearly universally and positively related to the likelihood of attending a four-year institution. The likelihood of two-year attendance is not impacted by greater intergenerational closure and greater peer social capital, however. These two resources are especially important because they are the social capital students develop outside of their families. Simply living in families that encourage college attendance may not be enough. Students receiving social support from outside of the scope of their parents are more

[30] I focus on the odds ratios in this discussion but comment on the relative change in coefficients across models when applicable.

likely to attend a four-year institution. Distance to the nearest institution is significant for predicting variation in two-year enrollment compared with non-enrollment in this pooled model. That is, students living at a greater distance from a two-year institution are less likely to enroll.

Besides the extracurricular involvement and noncognitive resources, students who display academic preparedness are more likely to enroll in two-year or four-year institutions. Students with college-going aspirations are over two hundred percent more likely to attend a four-year institution. Higher math achievement and greater math test score gains are also significantly related to attending college regardless of institutional type. The findings confirm earlier research on the relationship between cognitive ability and its association with post-secondary enrollment.

The individual control measures present a mixed picture of the likelihood of attendance in this model. The gender and socioeconomic status results are not surprising but there are unexpected findings for the race/ethnic groups. Women are more than thirty percent more likely than their male peers to attend a two-year college and over sixty percent more likely to attend a four-year college. Higher socioeconomic status is associated with greater likelihood of attending either type of institution compared with those who do not enroll. However, socioeconomic status increases the likelihood of enrollment more for four-year enrollees than for two-year enrollees compared to non-enrollees. Hispanic students are nearly twenty percent more likely than their white peers to attend a two-year college but not significantly more likely to attend a four-year college. Black students are over one hundred percent more likely than their white peers to attend a four-year college but marginally more likely to attend a two-year college. Asian students are over one hundred percent more likely to attend either a two-year college or a four-year college compared to their white peers. Where the literature characterizes race/ethnic minorities as in

under-represented on college campuses, students in these groups in this sample are more likely than their white peers to pursue post-secondary education.

Though the literature indicates that school resources are necessary for students' pursuit of a post-secondary degree, in this analysis, I see evidence of school factors predicting the likelihood of four-year enrollment compared to non-enrollment. It is compelling that in this final set of models no significant relationships exist between school factors and the likelihood of two-year enrollment. This implies that the likelihood of two-year enrollment is less significantly associated with school characteristics. As schools' minority enrollment increases, students' likelihood of attending a four-year institution increases by a small margin, compared with non-enrollment. This finding implies that attending a racially/ethnically homogeneous school may be associated with greater likelihood of enrollment in a four-year school. Conventional scholarship has shown that schools with a higher minority enrollment often lack the economic resources necessary to invest in their college-bound students (Hill 2008). Race/ethnic homogeneity in schools is more common in urban contexts and I will focus further on this finding in the contextual analysis. The same relationship exists for schools with an increasing number of full-time certified teachers or greater percentage of students enrolled in college preparatory. Teacher preparation is an important factor for helping students both be prepared and transition from high school to college. For students in schools with these attributes, the likelihood of enrolling in a four-year institution increases. As school poverty or the percentage of students enrolled in vocational courses increases, students' likelihood of enrolling in a four-year institution decreases.

These pooled models confirm much of what we know regarding higher education enrollment. Students from a higher socioeconomic status and women are well represented

(Grodsky and Jackson 2009; Haveman and Smeeding 2006). Additionally, engagement in extracurricular activities is strong predictor of enrollment (Covay and Carbonaro 2010). Colleges expect students to have this kind of involvement on their resumes in order to show preparation for higher education. Beyond the extracurriculum, students with higher aspirations and achievement are more likely to enroll in higher education. The significance of the urban variable indicates some spatial variation may be present. I address the contextual differences in the next section.

*7.6.2: Contextual Multinomial Logistic Regression Analysis*

To understand the variation across contexts, I estimate nested multinomial logistic regression models for urban, suburban and rural contexts and present the results of the analysis in Table 7.6. For ease of discussion, I include the full models for each spatial context rather than discussing each incremental model. Table 7.6 shows the relationship between key independent measures, individual and school controls and the likelihood of either two-year or four-year post-secondary enrollment. Rather than focusing on what increases (or decreases) the likelihood of attendance for each context, I review the measures with similar effects for either two-year or four-year enrollment across contexts. Then, I review the differences across contexts.

Only a few measures have the same effect on the likelihood of either two-year or four-year enrollment compared to non-enrollment. Increased engagement with problem behavior is associated with lowered likelihood of enrollment in either two-year or four-year institutions for students in all three contexts. Additionally, higher parental aspirations are associated with a greater likelihood of both two-year and four-year college enrollment for all three contexts. Overwhelmingly, both college-going aspirations and tenth grade math achievement also matter

for all students regardless of context. Students with college-going aspirations are more likely in all three contexts to enroll in either a two-year or four-year school (compared to those who do not enroll). As students' tenth grade math achievement increases, so does their likelihood of enrolling in either a two-year or four-year school. Beyond tenth grade math achievement, increasing test score gains provide an indication of how high achieving students fare in the college enrollment process. Greater test score gains are associated with an increased likelihood of four-year enrollment for all three contexts and an increased likelihood of two-year enrollment for suburban students. These are students who likely became more invested in their achievement as they neared the end of high school. While static achievement as a proxy for cognitive ability significantly predicts post-secondary enrollment, test score gains as a proxy for cognitive growth also matter for four-year enrollment.

Among the demographic measures, female students are more likely to enroll in two-year or four-year schools compared to those who do not enroll. This significant relationship is found for urban, suburban and rural students. As more women matriculate on college campuses (Aud et al. 2012), this finding confirms that context does not disadvantage women from any one place. As in previous analyses, increasing socioeconomic status is associated with an increased likelihood of enrollment in two-year or four-year institutions for all three contexts. These findings about the effects of gender and social class are especially compelling because they remain important even when combined with other potential predictors of the likelihood of post-secondary enrollment.

The rest of the independent variables seem to operate in one of several ways. First, variables may be statistically significant for a specific context or contexts. As in the case of distance to the nearest college, there is a statistically significant and negative relationship

between greater distance and likelihood of enrolling in a two-year or four-year school for only suburban students. In other cases, independent variables are statistically significantly related to enrollment in either two-year or four-year schools. In the case of engagement with school activities, there is a positive and significant association predicting the likelihood of four-year enrollment across all three contexts. Involvement in extracurricular activities is unrelated to two-year college enrollment for students regardless of their spatial context. This means that engagement with school life is not relevant for students who plan to pursue a two-year degree, further evidence that the college attendance process differs depending on institutional type. Finally, for a limited number of cases, there is a statistically significant relationship for only one or two contexts and one type of enrollment. This is the case for peer social capital and suburban four-year enrollment. While the cross-context variation looks complex in Table 7.6, there are some noteworthy patterns evolving in these models.

Sports involvement is positively and significantly related to two-year and four-year enrollment for rural students. This relationship is also found in the model comparing four-year enrollment for suburban students. Considering the popular narrative around the importance of athletics for rural communities, this finding is an important one. However, this finding extends the literature regarding the relevance of sports because these studies do not account for spatial context (Glennie and Stearns 2012; Shifrer et al. 2013). Though generally sports involvement is not significant in other analyses, this finding is also important because sports build skills in students including self-discipline, group-work, and dedication all necessary for individual success at the college level.

While the effects of noncognitive measures were consistently positive in the analyses of college-going aspirations and math achievement for students generally, in this contextual

analysis, they have varying effects. Greater technological capital is associated with increased enrollment in either a two-year or four-year school for urban and suburban students. Few studies consider the role of technology for the college application process, and this finding provides evidence that considering technology is an important part of understanding the likelihood of college enrollment, but not for rural students. Earlier analyses of the data show that technological capital is not uniformly distributed across all three contexts, and it remains a significant predictor of enrollment in different kinds of institutions for all but rural contexts. Greater intergenerational closure is positively related to the likelihood of four-year enrollment for suburban students, and for rural students, greater intergenerational closure is related to increased two-year and four-year enrollment. This contrast between spatial places is compelling because it implies that social networks may function differently for rural students, providing some support for the presumption that the social networks in rural places do carry knowledge about the college application process (Dyk and Wilson 1999; Israel et al. 2001).

Two other measures of social capital are significantly related to the likelihood of college enrollment for suburban students. Parent-child social capital is significantly associated with increased two-year enrollment in suburban contexts. Surprisingly, increasing peer social capital is only significantly related to increased four-year enrollment for suburban students. Peers that endorse the rewards of education are important for students to remain engaged with school life, but in this sample as peer social capital or peers' endorsement of studying, getting good grades and graduating from high school, increases, it appears that only suburban students see a boost in the likelihood of their four-year post-secondary enrollment. This suggests that students in rural or urban contexts with academically engaged peers do not necessarily see an increase in their likelihood of college attendance.

Distance to the nearest college presents another confounding relationship. Whereas in earlier analyses, the distance to the nearest college was significantly associated with rural students' math achievement and rural or urban test score gains, in these models, it is only significantly related to the likelihood of either two-year or four-year enrollment for suburban students. Greater distance to the nearest college is associated with lowered likelihood of either two-year or four-year enrollment for suburban students. Because we know little of how proximity to institution affects likelihood of enrollment, this finding confirms the limited evidence that spatial location is a crucial for future analyses. The only other analysis of proximity focuses on rural students and the disadvantage they suffer based on distance to nearest college or university.

In terms of demographic factors, the relationships are mixed depending on the institutional type and the context. Net of socioeconomic status and other controls, black students had a higher likelihood of enrollment in a four-year school in all three contexts. Asian students have a greater likelihood of enrollment in two-year or four-year schools in urban and suburban contexts.[31] Hispanic students in urban contexts are more likely to enroll in two-year institutions. Southern suburban students are less likely to enroll in two-year schools. Family size is associated with lower likelihood of enrollment for suburban and rural students. Suburban students with more siblings are less likely to enroll in either two-year or four-year schools. Suburban students with more siblings are less likely to enroll in two-year and four-year schools compared with non-enrollees. Increased mobility decreases the likelihood of two-year and four-year enrollment for suburban students as well. Increased mobility has a similar effect for urban students' likelihood of four-year enrollment.

[31] There are fewer Asian students in rural contexts.

Among school factors, we see a few significant relationships, and none that are unilaterally the same for all contexts. Increasing student/teacher ratios decreases the likelihood of four-year enrollment for urban students, but increases it for rural students. For urban students, this makes sense, because greater class sizes indicate less support and attention from teachers. While it difficult to know why larger class sizes would increase the likelihood of college attendance for rural students, one possible explanation is that larger class sizes indicate the school is large enough to diversify and specialize instruction. Average student/teacher ratios were smallest for rural schools indicating a potentially generalized curriculum and lack of resources (Monk 2007). However, it is difficult to know why this would be the case for rural students. Greater school poverty decreases the likelihood of four-year enrollment for urban students. This finding is consistent with the literature. Greater school poverty is an indicator of the community poverty associated with greater neighborhood disadvantage and overall worse outcomes for individual students. Students attending schools with more certified teachers have a greater likelihood of four-year enrollment in rural contexts. Teacher experience is especially relevant for improved rural student college attendance.

In terms of the curriculum, the literature characterizes schools with an academically rigorous school climate as more successful in transitioning students from high school to college. There is little evidence in this analysis to validate this claim by spatial context. I show that with greater enrollment in college-preparatory courses, there is an increased likelihood of four-year enrollment for urban and suburban students. No effects of tracking are present for rural students.

The portrait of college going looks different depending on spatial context. While many individual factors are consistent across contexts, there are differences in the way that measures of social capital and with institutional measures that remain unanswered.

## 7.7 Discussion

In this chapter, I have three broad conclusions regarding the spatial stratification of students' likelihood of college attendance. First, I find that the traditional approach to spatial context may mask nuances between the pooled sample and the contextual models. In the pooled models for the trichotomous measure of college attendance, I find some contextual variation that warrants further analysis by spatial context. Secondly, I consider two measures of students' college attendance to understand variation in enrollment by institutional type. Finally, I consider the joint impact of institutional type and spatial context and find that the likelihood of college enrollment varies considerably depending on both of these dimensions.

The comparison of pooled and contextual models in each analytical chapter of this project has yielded mixed results. For some measures, there is little variation between the pooled and contextual models, indicating little spatial variation in that particular measure. In the case of college attendance, comparing the pooled and contextual models, regardless of the way I measure college attendance, yields differences in significant predictors. Several of the noncognitive factors, distance to nearest college, and several individual controls were significant in the pooled models but their relevance in each spatial context varied. For instance, while intergenerational closure was largely positively and significantly related to the likelihood of college attendance in both the pooled logistic and multinomial logistic models, in the contextual analyses, I find that greater intergenerational closure predicts a greater likelihood of college attendance for rural students. This finding runs counter to Carr and Kefalas's contention that social capital matters for rural students. Family size and residential mobility are two important factors that have been widely considered in education scholarship. In the models for the entire sample, both are negatively related to enrollment in either two-year or four-year schools.

However, the contextual analysis shows that these disadvantages are mainly associated with suburban students' college attendance. These nuances to the understanding of college enrollment processes are extremely valuable for improving rates of college attendance in different spatial contexts, because we can see that one policy will not necessarily improve opportunities for all students. In other studies, scholars have compared enrollment in either a two-year or four-year school but have no taken the extra step to examine the likelihood of enrollment in each spatial context (Engberg and Wolniak 2010).

A second contribution of this analysis is the measurement of college attendance. I begin the analysis with a general measurement of college attendance regardless of institutional type before I analyze likelihood of enrollment in either a two-year or four-year school. These institutions present drastically different missions and experiences for their student constituencies. While there is some common ground regarding the positive predictors of post-secondary enrollment in either two-year or four-year schools, more of the significant predictors appear in the models comparing four-year enrollment with non-enrollment. In Appendix Q, I present supplementary models for the general college attendance outcome, using two-year enrollment as the reference group. Using these results, I am able to compare four-year enrollment and two-year enrollment directly. These models confirm the importance of certain factors for four-year enrollment over two year-enrollment. In this table, the main finding is that cognitive resources are an important predictor of the likelihood of four-year enrollment compared with two-year enrollment. Among noncognitive measures, intergenerational closure was especially important for predicting four-year enrollment over two-year enrollment, yielding the only significant effect. In these models, school factors are significantly related to whether students enroll in a four-year institution. Compared with our earlier analyses where I compare four-year and two-year

enrollment with non-enrollment, here we see some important distinctions for students choosing a specific institutional type, including the impact of school measures.

Finally, this analysis is unlike other studies of college enrollment or attendance because I take a detailed view of institutional type and spatial context. By attending to the nuances presented by both spatial context and institutional type, this analysis extends what we know about the likelihood of college enrollment for students in different kinds of places and for students considering different kinds of schools. These very specific contextual and institutional differences complicate the traditional explanations for college enrollment. Noncognitive measures, including measures of technological capital and social capital, presented an inconsistent picture in this analytical chapter. More of the social capital measures were significantly associated with greater likelihood of two-year or four-year attendance for suburban students. While some significant relationships exist for urban or rural students, suburban students seem to capitalize on these resources more than other contexts. This finding lends some support to the public discourse around the perceived advantages of living in a suburban contexts when it comes to post-secondary schooling.

In considering both institutional type and spatial context, I find that the issue of distance, while new to this kind of analysis, presents a puzzle for students' likelihood of college attendance. Distance is a negative and significant predictor of enrollment in the baseline models, but in the contextual analysis, distance is associated with lower likelihood of enrollment for only suburban students. With higher rates of enrollment overall, suburban students seem more likely to attend college compared to their urban and rural peers. As discussed in Chapter 3, suburban students' relative distance was shorter than rural students' but greater than urban students. It

seems that distance to nearest institution could be a deterrent to enrollment for suburban students.

Examining institutional type and spatial context, I find that very few of the school characteristics were significantly associated with the likelihood of college attendance. Additionally, there was little overlap in terms of the significant factors in all three contexts. The lack of significant school factors is notable because other studies of college enrollment cite the importance of school resources in understanding patterns of enrollment (Hill 2008; McDonough 1997). Several factors were related to the likelihood of four-year enrollment for urban students but only two factors were significant in either suburban or rural contexts. In urban schools, higher student teacher ratios and greater school poverty are associated with decreased likelihood of four-year enrollment while greater minority enrollment and more students enrolled in college-preparatory courses are related to higher likelihood of enrollment. In rural places, the staffing and teacher preparation characteristics are associated with higher four-year enrollment. In a supplementary analysis described earlier than included only school factors, I do find significant associations between these characteristics and the likelihood of college attendance. In these data, the individual factors and other key independent measures have a more significant impact on college attendance than the school factors.

When it comes to addressing the inequities in college enrollment through policy, it is the subtle differences based on institutional type and spatial context that draw attention to the importance of a multi-pronged strategy. Simply improving the number of full-time certified teachers will not necessarily change students' likelihood of enrollment in all places because this factor yielded benefits for urban and suburban students but not rural students. These subtleties are crucial for addressing how broad sweeping efforts to manage the secondary and post-

secondary education transition must be focused on the needs of each context rather than on the system as whole. Each of these issues will not be addressed with one policy reform that addresses one aspect of schooling. As the impact of key predictors, including school related characteristics manifests themselves differently depending on the context, and the task of equalizing college access becomes increasingly more difficult. In the final, concluding chapter, I address some strategies that address equalizing enrollment across contexts.

**Table 7.1: Means and Standard Deviations for College Attendance Measures, by context**

| Measures of college attendance | Urban (N = 2,580) | | Suburb (N = 4,980) | | Rural (N = 2,340) | |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD |
| Four-year enrollment | 0.420 | 0.494 | 0.420 $^{R}$ | 0.494 | 0.396 $^{S}$ | 0.489 |
| Two-year enrollment | 0.245 $^{SR}$ | 0.430 | 0.268 $^{U}$ | 0.443 | 0.271 $^{U}$ | 0.444 |
| No enrollment | 0.335 $^{S}$ | 0.472 | 0.312 $^{U}$ | 0.463 | 0.334 | 0.472 |

**Note:** Superscript R–mean is significantly different from mean for rural students at $p < 0.05$.
Superscript U–mean is significantly different from mean for urban students at $p < 0.05$.
Superscript S–mean is significantly different from mean for suburban students at $p < 0.05$.

**Table 7.2: Means and Standard Deviations for Independent Predictors of College Attendance, by enrollment status**

| | No enrollment | | Two-Year Enrollment | | Four-Year Enrollment | |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD |
| **Spatial Context** | | | | | | |
| Urban | 0.271 [T] | 0.444 | 0.243 [N] | 0.429 | 0.264 | 0.441 |
| Suburban | 0.485 [TF] | 0.500 | 0.513 [N] | 0.500 | 0.510 [N] | 0.500 |
| Rural | 0.244 | 0.430 | 0.243 | 0.429 | 0.226 | 0.418 |
| **Extracurriculum** | | | | | | |
| Problem Behavior | 0.259 [TF] | 0.829 | 0.003 [FN] | 0.582 | -0.180 [TN] | 0.429 |
| Activity Involvement | 0.617 [TF] | 1.090 | 0.796 [FN] | 1.180 | 1.314 [TN] | 1.404 |
| Sports Involvement | 0.625 [F] | 1.256 | 0.676 [F] | 1.171 | 0.743 [TN] | 1.135 |
| **Noncognitive Resources** | | | | | | |
| Technological Capital | -0.405 [TF] | 1.188 | -0.030 [FN] | 0.923 | 0.187 [TN] | 0.673 |
| Parental Aspirations | 0.476 [TF] | 0.500 | 0.713 [FN] | 0.452 | 0.923 [TN] | 0.266 |
| Intergenerational Closure | -0.202 [TF] | 0.697 | -0.093 [FN] | 0.715 | 0.078 [TN] | 0.753 |
| Parent-Child Social Capital | -0.157 [TF] | 0.608 | -0.029 [FN] | 0.598 | 0.050 [TN] | 0.550 |
| Peer Social Capital | -0.235 [TF] | 0.919 | -0.034 [FN] | 0.817 | 0.113 [TN] | 0.748 |
| **Distance to nearest college** | | | | | | |
| Distance | 7.466 [TF] | 11.650 | 6.832 [FN] | 9.242 | 6.050 [TN] | 9.857 |
| **Aspirations/Achievement** | | | | | | |
| Students' aspirations | 0.781 [TF] | 0.414 | 0.943 [FN] | 0.233 | 0.990 [TN] | 0.099 |
| Gr. 10 Math | 30.830 [TF] | 10.404 | 35.128 [FN] | 10.111 | 44.044 [TN] | 10.505 |
| Test Score Gains | 7.249 [TF] | 6.476 | 8.787 [FN] | 6.743 | 12.384 [TN] | 6.787 |
| **Individual Factors** | | | | | | |
| Female | 0.440 [TF] | 0.496 | 0.528 [N] | 0.499 | 0.548 [N] | 0.498 |
| White | 0.469 [TF] | 0.499 | 0.518 [FN] | 0.500 | 0.579 [TN] | 0.494 |
| Hispanic | 0.200 [TF] | 0.400 | 0.171 [FN] | 0.376 | 0.084 [TN] | 0.277 |
| Black | 0.160 [TF] | 0.367 | 0.129 [N] | 0.335 | 0.119 [N] | 0.323 |
| Asian | 0.045 [TF] | 0.207 | 0.098 [FN] | 0.298 | 0.131 [TN] | 0.338 |
| Socioeconomic status | -0.394 [TF] | 0.618 | -0.148 [FN] | 0.641 | 0.255 [TN] | 0.702 |
| South | 0.416 [TF] | 0.493 | 0.361 [N] | 0.480 | 0.380 [N] | 0.485 |
| Two-parent | 0.711 [TF] | 0.454 | 0.751 [FN] | 0.432 | 0.803 [TN] | 0.398 |
| Number of siblings | 2.737 [TF] | 1.671 | 2.357 [FN] | 1.537 | 2.103 [TN] | 1.416 |
| Mobility | 1.474 [TF] | 1.618 | 1.261 [FN] | 1.513 | 1.076 [TN] | 1.383 |
| **School Factors** | | | | | | |
| Percent Minority | 40.169 [TF] | 33.161 | 37.760 [FN] | 31.188 | 33.446 [TN] | 30.780 |
| Student/Teacher ratio | 17.393 [F] | 3.948 | 17.512 [F] | 4.101 | 17.142 [TN] | 3.685 |
| School Poverty | 26.984 [TF] | 18.435 | 24.315 [FN] | 18.055 | 18.859 [TN] | 16.039 |
| % FT Certified Teachers | 96.142 [F] | 11.477 | 96.381 [F] | 11.276 | 97.371 [TN] | 10.007 |
| % College Prep | 50.942 [F] | 30.059 | 52.569 [F] | 31.590 | 62.344 [TN] | 30.069 |
| % Vocational | 19.955 [F] | 21.738 | 18.894 [F] | 21.919 | 16.447 [TN] | 19.459 |

**Note:** Superscript T–mean is significantly different from mean for two-year enrollees at $p < 0.05$.

Superscript F–mean is significantly different from mean for four-year enrolless at $p < 0.05$.

Superscript N–mean is significantly different from mean for non-enrollees at $p < 0.05$.

**N = 9,910**

**Table 7.3: Logistic Regression Analysis of the Likelihood of College Attendance, pooled results**

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | | Model 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Independent Predictors** | $\beta$ | e($\beta$) | S.E. | $\beta$ | e($\beta$) | S.E. | $\beta$ | e($\beta$) | S.E. | $\beta$ | e($\beta$) | S.E. | $\beta$ | e($\beta$) | S.E. |
| **Spatial Context** | | | | | | | | | | | | | | | |
| Urban | -0.006 | 0.994 | 0.088 | -0.034 | 0.967 | 0.091 | 0.088 | 1.092 | 0.093 | -0.014 | 0.986 | 0.095 | -0.005 | 0.995 | 0.103 |
| Suburban | 0.101 | 1.106 | 0.075 | 0.036 | 1.037 | 0.076 | 0.046 | 1.047 | 0.078 | -0.050 | 0.951 | 0.079 | -0.052 | 0.950 | 0.082 |
| **Extracurriculum** | | | | | | | | | | | | | | | |
| Problem Behavior | | | | -0.630 | 0.533 | 0.054 *** | -0.444 | 0.641 | 0.052 *** | -0.440 | 0.644 | 0.052 *** | -0.439 | 0.645 | 0.052 *** |
| Activity Involvement | | | | 0.223 | 1.249 | 0.024 *** | 0.145 | 1.156 | 0.023 *** | 0.112 | 1.118 | 0.023 *** | 0.114 | 1.120 | 0.023 *** |
| Sports Involvement | | | | 0.035 | 1.036 | 0.026 | 0.064 | 1.067 | 0.026 * | 0.080 | 1.083 | 0.028 ** | 0.086 | 1.090 | 0.028 ** |
| **Noncognitive Resources** | | | | | | | | | | | | | | | |
| Technological Capital | | | | 0.404 | 1.497 | 0.029 *** | 0.250 | 1.285 | 0.029 *** | 0.167 | 1.182 | 0.030 *** | 0.166 | 1.181 | 0.029 *** |
| Parental Aspirations | | | | 1.344 | 3.835 | 0.061 *** | 0.784 | 2.190 | 0.069 *** | 0.677 | 1.967 | 0.072 *** | 0.674 | 1.962 | 0.072 *** |
| Intergenerational Closure | | | | 0.198 | 1.218 | 0.040 *** | 0.144 | 1.155 | 0.042 ** | 0.121 | 1.129 | 0.041 ** | 0.122 | 1.130 | 0.041 ** |
| Parent-Child Social Capital | | | | 0.114 | 1.121 | 0.047 * | 0.189 | 1.208 | 0.050 *** | 0.107 | 1.113 | 0.053 * | 0.107 | 1.113 | 0.053 * |
| Peer Social Capital | | | | 0.111 | 1.117 | 0.036 ** | 0.113 | 1.119 | 0.037 ** | 0.077 | 1.080 | 0.039 + | 0.078 | 1.081 | 0.038 + |
| **Distance to nearest college** | | | | | | | | | | | | | | | |
| Distance | | | | -0.009 | 0.991 | 0.002 *** | -0.009 | 0.991 | 0.003 ** | -0.007 | 0.993 | 0.003 ** | -0.006 | 0.994 | 0.003 * |
| **Aspirations/Achievement** | | | | | | | | | | | | | | | |
| Students' aspirations | | | | | | | 0.607 | 1.834 | 0.078 *** | 0.542 | 1.719 | 0.078 *** | 0.537 | 1.711 | 0.079 *** |
| Gr. 10 Math | | | | | | | 0.048 | 1.049 | 0.003 *** | 0.045 | 1.046 | 0.003 *** | 0.045 | 1.046 | 0.003 *** |
| Test Score Gains | | | | | | | 0.040 | 1.041 | 0.004 *** | 0.038 | 1.038 | 0.004 *** | 0.037 | 1.038 | 0.004 *** |
| **Individual Factors** | | | | | | | | | | | | | | | |
| Female | | | | | | | | | | 0.401 | 1.494 | 0.056 *** | 0.401 | 1.494 | 0.056 *** |
| Hispanic | | | | | | | | | | 0.134 | 1.144 | 0.081 + | 0.127 | 1.135 | 0.088 |
| Black | | | | | | | | | | 0.410 | 1.507 | 0.095 *** | 0.388 | 1.474 | 0.097 *** |
| Asian | | | | | | | | | | 0.836 | 2.306 | 0.137 *** | 0.813 | 2.256 | 0.139 *** |
| Socioeconomic status | | | | | | | | | | 0.516 | 1.676 | 0.047 *** | 0.496 | 1.643 | 0.049 *** |
| South | | | | | | | | | | -0.239 | 0.788 | 0.062 *** | -0.231 | 0.794 | 0.070 ** |
| Two-parent | | | | | | | | | | -0.043 | 0.958 | 0.062 | -0.046 | 0.955 | 0.062 |
| Number of siblings | | | | | | | | | | -0.090 | 0.914 | 0.019 *** | -0.087 | 0.916 | 0.019 *** |
| Mobility | | | | | | | | | | -0.070 | 0.933 | 0.019 *** | -0.072 | 0.931 | 0.019 *** |
| **School Factors** | | | | | | | | | | | | | | | |
| Percent Minority | | | | | | | | | | | | | 0.002 | 1.002 | 0.002 |
| Student/Teacher ratio | | | | | | | | | | | | | -0.001 | 0.999 | 0.009 |
| School Poverty | | | | | | | | | | | | | -0.003 | 0.997 | 0.003 |
| % FT Certified Teachers | | | | | | | | | | | | | 0.004 | 1.004 | 0.002 |
| % College Prep | | | | | | | | | | | | | 0.001 | 1.001 | 0.001 |
| % Vocational | | | | | | | | | | | | | -0.002 | 0.998 | 0.002 |
| ***Constant*** | 0.691 | 1.996 | 0.055 *** | -0.214 | 0.808 | 0.079 ** | -2.374 | 0.093 | 0.124 *** | -1.880 | 0.153 | 0.160 *** | -2.261 | 0.104 | 0.359 *** |

**Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$**

$N = 9{,}910$

**Table 7.4: Logistic Regression Analysis of the Likelihood of College Attendance, by context**

| | Urban (N = 2,580) | | | | Suburban (N = 4,980) | | | | Rural (N = 2,340) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | e($\beta$) | S.E. | | $\beta$ | e($\beta$) | S.E. | | $\beta$ | e($\beta$) | S.E. | |
| **Extracurriculum** | | | | | | | | | | | | |
| Problem Behavior | -0.375 | 0.687 | 0.091 | *** | -0.463 | 0.629 | 0.076 | *** | -0.483 | 0.617 | 0.123 | *** |
| Activity Involvement | 0.104 | 1.109 | 0.048 | * | 0.112 | 1.118 | 0.035 | ** | 0.125 | 1.133 | 0.048 | ** |
| Sports Involvement | 0.044 | 1.045 | 0.052 | | 0.048 | 1.049 | 0.043 | | 0.182 | 1.199 | 0.046 | *** |
| **Noncognitive Resources** | | | | | | | | | | | | |
| Technological Capital | 0.179 | 1.196 | 0.049 | *** | 0.189 | 1.208 | 0.045 | *** | 0.110 | 1.116 | 0.065 | + |
| Parental Aspirations | 0.545 | 1.724 | 0.155 | ** | 0.790 | 2.203 | 0.099 | *** | 0.609 | 1.839 | 0.139 | *** |
| Intergenerational Closure | 0.118 | 1.126 | 0.077 | | 0.072 | 1.074 | 0.061 | | 0.237 | 1.267 | 0.089 | ** |
| Parent-Child Social Capital | 0.102 | 1.107 | 0.097 | | 0.161 | 1.174 | 0.080 | * | 0.002 | 1.002 | 0.118 | |
| Peer Social Capital | -0.012 | 0.988 | 0.065 | | 0.117 | 1.124 | 0.047 | * | 0.109 | 1.115 | 0.095 | |
| **Distance to nearest college** | | | | | | | | | | | | |
| Distance | 0.002 | 1.002 | 0.025 | | **-0.011** | **0.989** | **0.003** | *** | 0.005 | 1.005 | 0.007 | |
| **Aspirations/Achievement** | | | | | | | | | | | | |
| Students' aspirations | 0.566 | 1.761 | 0.153 | *** | 0.520 | 1.682 | 0.112 | *** | 0.550 | 1.733 | 0.155 | ** |
| Gr. 10 Math | **0.045** | **1.046** | **0.005** | *** | **0.043** | **1.044** | **0.004** | *** | **0.046** | **1.047** | **0.006** | *** |
| Test Score Gains | **0.036** | **1.037** | **0.010** | ** | **0.038** | **1.039** | **0.006** | *** | **0.037** | **1.038** | **0.009** | *** |
| **Individual Factors** | | | | | | | | | | | | |
| Female | 0.383 | 1.467 | 0.103 | *** | 0.424 | 1.528 | 0.085 | *** | 0.357 | 1.430 | 0.113 | ** |
| Hispanic | 0.203 | 1.225 | 0.148 | | 0.039 | 1.040 | 0.132 | | 0.225 | 1.253 | 0.237 | |
| Black | 0.418 | 1.519 | 0.163 | * | 0.331 | 1.393 | 0.137 | * | 0.427 | 1.533 | 0.229 | + |
| Asian | 0.835 | 2.305 | 0.224 | *** | 0.863 | 2.371 | 0.213 | *** | 0.521 | 1.684 | 0.443 | |
| Socioeconomic status | 0.512 | 1.668 | 0.098 | *** | 0.431 | 1.539 | 0.071 | *** | 0.631 | 1.880 | 0.103 | *** |
| South | -0.198 | 0.820 | 0.130 | | -0.271 | 0.762 | 0.110 | * | -0.176 | 0.839 | 0.133 | |
| Two-parent | -0.073 | 0.929 | 0.118 | | -0.058 | 0.944 | 0.093 | | -0.040 | 0.961 | 0.131 | |
| Number of siblings | -0.051 | 0.950 | 0.037 | | -0.119 | 0.888 | 0.029 | *** | -0.072 | 0.930 | 0.046 | |
| Mobility | **-0.059** | **0.943** | **0.038** | | **-0.084** | **0.920** | **0.028** | ** | -0.057 | 0.944 | 0.042 | |
| **School Factors** | | | | | | | | | | | | |
| Percent Minority | **0.006** | **1.006** | **0.003** | + | **0.001** | **1.001** | **0.002** | | **0.002** | **1.002** | **0.004** | |
| Student/Teacher ratio | **0.001** | **1.001** | **0.017** | | **-0.006** | **0.994** | **0.013** | | **0.015** | **1.015** | **0.018** | |
| School Poverty | -0.008 | 0.992 | 0.006 | | -0.005 | 0.995 | 0.004 | | 0.003 | 1.003 | 0.007 | |
| % FT Certified Teachers | **0.004** | **1.004** | **0.004** | | **0.001** | **1.001** | **0.003** | | **0.009** | **1.009** | **0.004** | + |
| % College Prep | **0.002** | **1.002** | **0.002** | | **0.001** | **1.001** | **0.002** | | **0.000** | **1.000** | **0.003** | |
| % Vocational | **0.000** | **1.000** | **0.002** | | **-0.003** | **0.997** | **0.003** | | **-0.002** | **0.998** | **0.004** | |
| ***Constant*** | -2.521 | 0.080 | 0.698 | *** | -1.618 | 0.198 | 0.472 | ** | -3.304 | 0.037 | 0.596 | *** |

**Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$**

**Table 7.5: Multinomial Logit Models Comparing Likelihood of Two-year or Four-year Enrollment to No Enrollment, pooled sample**

| | Two-Year vs. No College | | | | Four-Year vs. No College | | | |
|---|---|---|---|---|---|---|---|---|
| **Independent Predictors** | β | e(β) | S.E. | | β | e(β) | S.E. | |
| **Spatial Context** | | | | | | | | |
| Urban | -0.225 | 0.799 | 0.120 | + | 0.294 | 1.342 | 0.133 | * |
| Suburb | -0.086 | 0.918 | 0.095 | | -0.024 | 0.976 | 0.103 | |
| **Extracurriculum** | | | | | | | | |
| Problem Behavior | -0.300 | 0.741 | 0.052 | *** | -0.704 | 0.494 | 0.074 | *** |
| Activity Involvement | 0.043 | 1.044 | 0.027 | | 0.177 | 1.194 | 0.028 | *** |
| Sports Involvement | 0.049 | 1.050 | 0.030 | | 0.140 | 1.150 | 0.034 | *** |
| **Noncognitive Resources** | | | | | | | | |
| Technological Capital | 0.155 | 1.168 | 0.034 | *** | 0.192 | 1.211 | 0.037 | *** |
| Parental Aspirations | 0.446 | 1.563 | 0.077 | *** | 1.007 | 2.738 | 0.098 | *** |
| Intergenerational Closure | 0.072 | 1.075 | 0.045 | | 0.193 | 1.213 | 0.049 | *** |
| Parent-Child Social Capital | 0.104 | 1.109 | 0.056 | + | 0.116 | 1.123 | 0.067 | + |
| Peer Social Capital | 0.060 | 1.062 | 0.048 | | 0.101 | 1.106 | 0.043 | * |
| **Distance** | | | | | | | | |
| Distance to nearest college | -0.006 | 0.994 | 0.004 | + | -0.004 | 0.996 | 0.003 | |
| **Aspirations/Achievement** | | | | | | | | |
| Students' aspirations | 0.390 | 1.478 | 0.087 | *** | 0.900 | 2.461 | 0.104 | *** |
| Gr. 10 Math | 0.019 | 1.019 | 0.003 | *** | 0.076 | 1.079 | 0.004 | *** |
| Test Score Gains | 0.016 | 1.016 | 0.005 | ** | 0.065 | 1.067 | 0.005 | *** |
| **Individual Factors** | | | | | | | | |
| Female | 0.329 | 1.389 | 0.059 | *** | 0.504 | 1.656 | 0.067 | *** |
| Hispanic | 0.173 | 1.189 | 0.097 | + | -0.025 | 0.975 | 0.111 | |
| Black | 0.174 | 1.191 | 0.106 | + | 0.729 | 2.072 | 0.121 | *** |
| Asian | 0.803 | 2.232 | 0.142 | *** | 0.794 | 2.212 | 0.156 | *** |
| Socioeconomic status | 0.323 | 1.381 | 0.052 | *** | 0.685 | 1.985 | 0.059 | *** |
| South | -0.257 | 0.774 | 0.082 | ** | -0.182 | 0.833 | 0.087 | * |
| Two-parent | -0.042 | 0.959 | 0.065 | | -0.069 | 0.933 | 0.079 | |
| Number of siblings | -0.082 | 0.921 | 0.020 | *** | -0.093 | 0.911 | 0.023 | *** |
| Mobility | -0.052 | 0.950 | 0.021 | * | -0.095 | 0.910 | 0.023 | *** |
| **School Factors** | | | | | | | | |
| Percent Minority | 0.001 | 1.001 | 0.002 | | 0.003 | 1.003 | 0.002 | + |
| Student/Teacher ratio | 0.006 | 1.006 | 0.010 | | -0.011 | 0.989 | 0.012 | |
| School Poverty | -0.001 | 0.999 | 0.003 | | -0.007 | 0.993 | 0.003 | * |
| % FT Certified Teachers | 0.001 | 1.001 | 0.003 | | 0.008 | 1.008 | 0.003 | ** |
| % College Prep | -0.001 | 0.999 | 0.001 | | 0.004 | 1.004 | 0.001 | ** |
| % Vocational | 0.000 | 1.000 | 0.002 | | -0.004 | 0.996 | 0.002 | + |
| ***Constant*** | -1.319 | 0.267 | 0.417 | ** | -5.533 | 0.004 | 0.417 | *** |

**Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$**

***N* = 9,910**

**Table 7.6: Multinomial Logit Models Comparing Likelihood of Two-year or Four-year Enrollment to No Enrollment, by context**

| | Urban (N = 2,580) | | | | | | Suburban (N = 4,980) | | | | | | Rural (N = 2,340) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Two-Year vs. Non-Enrollment | | | Four-Year vs. Non-Enrollment | | | Two-Year vs. Non-Enrollment | | | Four-Year vs. Non-Enrollment | | | Two-Year vs. Non-Enrollment | | | Four-Year vs. Non-Enrollment | | |
| **Independent Predictors** | β | e(β) | S.E. | β | e(β) | S.E. | β | e(β) | S.E. | β | e(β) | S.E. | β | e(β) | S.E. | β | e(β) | S.E. |
| **Engagement with Extracurriculum** | | | | | | | | | | | | | | | | | | |
| Problem Behavior | -0.234 | 0.791 | 0.090 * | -0.584 | 0.557 | 0.121 *** | -0.333 | 0.717 | 0.073 *** | -0.761 | 0.467 | 0.109 *** | -0.325 | 0.723 | 0.122 ** | -0.816 | 0.442 | 0.183 *** |
| Activity Involvement | 0.015 | 1.015 | 0.060 | 0.173 | 1.189 | 0.058 ** | 0.054 | 1.056 | 0.038 | 0.162 | 1.176 | 0.042 *** | 0.038 | 1.039 | 0.055 | 0.220 | 1.246 | 0.057 *** |
| Sports Involvement | 0.032 | 1.032 | 0.056 | 0.053 | 1.054 | 0.062 | 0.004 | 1.004 | 0.046 | 0.120 | 1.127 | 0.053 * | 0.132 | 1.141 | 0.047 ** | 0.265 | 1.303 | 0.057 *** |
| **Noncognitive resources** | | | | | | | | | | | | | | | | | | |
| Technological Capital | 0.152 | 1.164 | 0.057 ** | 0.225 | 1.252 | 0.066 ** | 0.190 | 1.210 | 0.048 *** | 0.193 | 1.213 | 0.064 ** | 0.096 | 1.100 | 0.071 | 0.134 | 1.144 | 0.086 |
| Parental Aspirations | 0.297 | 1.346 | 0.172 + | 0.865 | 2.375 | 0.200 *** | 0.590 | 1.803 | 0.104 *** | 1.087 | 2.966 | 0.134 *** | 0.339 | 1.403 | 0.147 * | 1.028 | 2.795 | 0.198 *** |
| Intergenerational Closure | 0.085 | 1.089 | 0.082 | 0.153 | 1.165 | 0.098 | 0.011 | 1.011 | 0.070 | 0.160 | 1.174 | 0.068 * | 0.189 | 1.208 | 0.096 * | 0.314 | 1.369 | 0.099 ** |
| Parent-Child Social Capital | 0.080 | 1.083 | 0.113 | 0.133 | 1.143 | 0.105 | 0.191 | 1.211 | 0.085 * | 0.115 | 1.122 | 0.097 | -0.061 | 0.941 | 0.131 | 0.110 | 1.116 | 0.135 |
| Peer Social Capital | 0.006 | 1.006 | 0.084 | -0.041 | 0.960 | 0.077 | 0.076 | 1.079 | 0.053 | 0.181 | 1.199 | 0.060 ** | 0.107 | 1.113 | 0.108 | 0.102 | 1.107 | 0.094 |
| **Distance to nearest college** | | | | | | | | | | | | | | | | | | |
| Distance | 0.012 | 1.013 | 0.029 | -0.018 | 0.982 | 0.028 | -0.014 | 0.986 | 0.005 ** | -0.007 | 0.993 | 0.003 * | 0.004 | 1.004 | 0.007 | 0.005 | 1.005 | 0.008 |
| **Aspirations and Achievement** | | | | | | | | | | | | | | | | | | |
| Students' aspirations | 0.454 | 1.575 | 0.173 * | 0.818 | 2.267 | 0.188 *** | 0.346 | 1.413 | 0.116 ** | 1.009 | 2.742 | 0.162 *** | 0.448 | 1.565 | 0.176 * | 0.788 | 2.199 | 0.199 *** |
| Gr. 10 Math | 0.018 | 1.019 | 0.006 ** | 0.071 | 1.074 | 0.007 *** | 0.018 | 1.019 | 0.005 *** | 0.078 | 1.081 | 0.005 *** | 0.021 | 1.021 | 0.006 ** | 0.080 | 1.084 | 0.007 *** |
| Test Score Gains | 0.016 | 1.017 | 0.010 | 0.058 | 1.060 | 0.012 *** | 0.017 | 1.017 | 0.006 ** | 0.067 | 1.070 | 0.008 *** | 0.014 | 1.014 | 0.010 | 0.069 | 1.072 | 0.011 *** |
| **Individual Characteristics** | | | | | | | | | | | | | | | | | | |
| Female | 0.243 | 1.275 | 0.107 * | 0.546 | 1.726 | 0.124 *** | 0.355 | 1.427 | 0.087 *** | 0.527 | 1.694 | 0.103 *** | 0.335 | 1.397 | 0.126 ** | 0.411 | 1.508 | 0.131 ** |
| Hispanic | 0.325 | 1.384 | 0.168 + | -0.023 | 0.977 | 0.169 | 0.041 | 1.042 | 0.138 | -0.051 | 0.950 | 0.174 | 0.263 | 1.300 | 0.249 | 0.096 | 1.101 | 0.317 |
| Black | 0.203 | 1.224 | 0.180 | 0.692 | 1.999 | 0.192 *** | 0.090 | 1.094 | 0.150 | 0.775 | 2.171 | 0.173 *** | 0.317 | 1.373 | 0.248 | 0.588 | 1.801 | 0.307 + |
| Asian | 0.914 | 2.495 | 0.229 *** | 0.750 | 2.118 | 0.252 ** | 0.778 | 2.178 | 0.216 *** | 0.938 | 2.555 | 0.237 *** | 0.654 | 1.923 | 0.487 | 0.306 | 1.358 | 0.449 |
| Socioeconomic status | 0.416 | 1.516 | 0.104 *** | 0.568 | 1.764 | 0.115 *** | 0.179 | 1.196 | 0.076 * | 0.773 | 2.166 | 0.084 *** | 0.560 | 1.751 | 0.105 *** | 0.678 | 1.970 | 0.133 *** |
| South | -0.207 | 0.813 | 0.164 | -0.187 | 0.830 | 0.159 | -0.285 | 0.752 | 0.121 * | -0.206 | 0.814 | 0.136 | -0.158 | 0.854 | 0.176 | -0.165 | 0.848 | 0.156 |
| Two-parent | -0.116 | 0.890 | 0.123 | -0.036 | 0.965 | 0.154 | -0.038 | 0.963 | 0.097 | -0.101 | 0.903 | 0.118 | -0.033 | 0.967 | 0.143 | -0.084 | 0.920 | 0.165 |
| Number of siblings | -0.049 | 0.952 | 0.037 | -0.055 | 0.947 | 0.047 | -0.106 | 0.899 | 0.031 ** | -0.134 | 0.874 | 0.036 *** | -0.075 | 0.928 | 0.053 | -0.066 | 0.936 | 0.048 |
| Mobility | -0.029 | 0.972 | 0.041 | -0.092 | 0.912 | 0.045 * | -0.062 | 0.940 | 0.030 * | -0.108 | 0.898 | 0.034 ** | -0.049 | 0.952 | 0.045 | -0.063 | 0.939 | 0.048 |
| **School Characteristics** | | | | | | | | | | | | | | | | | | |
| Percent Minority | 0.005 | 1.005 | 0.004 | 0.008 | 1.008 | 0.004 * | 0.001 | 1.001 | 0.002 | 0.001 | 1.001 | 0.003 | 0.000 | 1.000 | 0.004 | 0.004 | 1.004 | 0.005 |
| Student/Teacher ratio | 0.029 | 1.030 | 0.021 | -0.040 | 0.961 | 0.022 + | 0.005 | 1.005 | 0.015 | -0.022 | 0.978 | 0.016 | -0.010 | 0.990 | 0.023 | 0.058 | 1.060 | 0.024 * |
| School Poverty | -0.003 | 0.997 | 0.006 | -0.016 | 0.985 | 0.007 * | -0.005 | 0.995 | 0.004 | -0.004 | 0.996 | 0.005 | 0.008 | 1.008 | 0.008 | -0.008 | 0.992 | 0.007 |
| % FT Certified Teachers | 0.004 | 1.004 | 0.005 | 0.003 | 1.003 | 0.004 | -0.002 | 0.998 | 0.004 | 0.006 | 1.006 | 0.004 | 0.006 | 1.006 | 0.005 | 0.011 | 1.011 | 0.005 * |
| % College Prep | 0.000 | 1.000 | 0.002 | 0.005 | 1.005 | 0.002 * | -0.001 | 0.999 | 0.002 | 0.004 | 1.004 | 0.002 * | 0.000 | 1.000 | 0.003 | -0.001 | 0.999 | 0.003 |
| % Vocational | 0.001 | 1.001 | 0.003 | -0.001 | 0.999 | 0.003 | -0.001 | 0.999 | 0.003 | -0.006 | 0.994 | 0.004 | -0.001 | 0.999 | 0.004 | -0.003 | 0.997 | 0.004 |
| Constant | -2.519 | 0.081 | 0.819 ** | -4.005 | 0.018 | 0.831 *** | -0.723 | 0.485 | 0.542 | -5.161 | 0.006 | 0.587 *** | -1.961 | 0.141 | 0.635 ** | -7.163 | 0.001 | 0.769 *** |

Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

# CHAPTER 8: CONCLUSIONS

Though rural schools have closed a long-standing high school graduation gap compared with urban schools, they struggle to achieve parity in college graduation rates. Sociology of education literature on college attendance explains this stratification using race/ethnic or social class differences, but has not fully explored spatial stratification comparing urban, suburban **and** rural students. Stratification research is typically rooted in status attainment and social reproduction theories, yet these frameworks rarely situate student outcomes in spatial context. Using data from the Education Longitudinal Study of 2002, I addressed four central analytical questions to understand spatial stratification of the likelihood of college attendance. I conducted a series of four analyses, comparing pooled models for a sample of public school students with contextual models focused on spatial location. I examined sociological factors related to students' school outcomes before using these outcomes as predictors in subsequent models, building towards an understanding of two-year and four-year college enrollment. This project adds to both the college preparedness and college access literatures by examining spatial context as a central dimension of stratification. I show that consistency between the pooled and contextual analytical results varied depending on the dependent outcome in question. That is, for some predictors of college attendance like students' college-going aspirations, there was little difference between the pooled public school student sample and their contextual groups. However, for some predictors like college enrollment, the pooled analyses masked nuances within each spatial context. The methodological and substantive findings in this project are consequential for improving college enrollment for students from disparate spatial contexts.

There are two important methodological findings emerging from this analysis. First, the methodological strategy allowed for a close examination of each spatial context. Instead of simply controlling for the impact of context, I was interested in knowing whether and how the traditional explanations of stratification varied across contexts. The comparative strategy (pooled models and contextual models) represents a departure from the traditional approach to spatial context in the literature, and it yielded a few important findings. First, it was possible for independent predictors to remain insignificant in the pooled models but still exert significant effects in the contextual models. This was the case in the analysis of noncognitive measures in Chapter 4. Or alternately, it was possible that significant effects in the pooled models were relevant in a specific spatial location in the contextual models. This was the case in the analysis of students' math achievement in Chapter 6 and in the multinomial logit analysis of college enrollment in Chapter 7 where significant relationships between school factors and these dependent measures in the pooled models were inconsistent with these same relationships in the contextual models. This strategy allowed for greater specificity regarding the relationships between variables and the likelihood of college attendance. In subsequent chapters on math achievement and especially on college attendance, however, the pooled models obscure some nuances in the contextual models.

Secondly, in analyzing several factors related to college attendance, I consider stratification of some conventional explanations before using these variables to predict spatial stratification of ultimate college enrollment. In the chapter on noncognitive outcomes, I analyze several noncognitive resources rather than focus exclusively on social capital. In the chapter on student achievement, I consider a snapshot of math achievement as well as a measure of growth over time. In the final chapter, I experiment with measuring college attendance with a general

and more specific measure of this student outcome. In each of these chapters, we have the chance to see how measurement matters a great deal when trying to understand factors related to school success for students. In the chapter on student achievement, specifically, the comparison of static tenth grade math achievement and test score gains represents a slight departure from the literature, which focuses largely on a snapshot of achievement and in very limited cases on these test score gains measures. The models in this chapter show that the dependent measure and the comparison of spatial context enhance our understanding of factors that impact students' achievement. Additionally, we see in the final chapter on college attendance that measurement matters a great deal to understanding the factors associated with pursuit of post-secondary education. In these models, the traditional explanations of who pursue higher education apply to enrollment at a four-year institution but not at a two-year institution.

The methodological approach gives way to several compelling substantive findings. First I find that context matters for understanding stratification of college attendance. Scholars typically characterize non-suburban contexts as lacking crucial resources related to student outcomes. This approach to context, grouping spatial locations together, layers assumptions about and conceals crucial distinctions between spatial contexts. In the analysis of noncognitive factors, it was less common for variables to exert similar effects in urban *and* rural places. However, for many of these noncognitive resources including technological capital and parent-child social capital, urban or rural places had more in common with suburban contexts. For example, greater engagement with problem behavior was negatively associated with suburban and rural students' intergenerational closure and peer social capital. These are resources that exert common effects for non-urban places. Alternately, greater engagement with athletics is negatively associated with tenth grade math achievement for urban and suburban students. Here,

non-rural students active in high school athletics see disadvantages. Examining the effects of these factors with greater specificity moves scholars beyond these overarching labels like non-urban and non-rural. There were few significant effects common to urban and rural places (and not suburban places), and more instances of similarities between both urban and suburban places or rural and suburban places. In analyses of students' college-going aspirations, math achievement and college attendance, though, it was more common for factors to significantly predict suburban students' outcomes while remaining less significant in both urban and rural contexts. In a policy discourse where scholars typically invoke urban schools or urban students as the archetype of disadvantage, it is clear from this analysis that living in either an urban or rural context has its benefits and drawbacks.

One common theme in every analytical chapter, however, is the significance of students' socioeconomic status in predicting better school outcomes. Consistent with status attainment research, family background remains vital for understanding students' post-secondary aspirations and their ultimate college enrollment. Regardless of the outcome and regardless of the context, students from a higher socioeconomic background maintained an advantage in these analyses. In the preceding chapters, I show consistent significant relationships between socioeconomic status and availability of different noncognitive resources like technological and social capital as well as a higher likelihood of college-going aspirations. The combination of these factors propels already advantaged students further, making it challenging for students from a lower social class status to keep up with their peers. While the interaction terms measuring additional advantages based on socioeconomic status did not yield significant effects in the pooled models, the contextual models show that within each context students from a higher-SES background will exhibit higher math achievement and a greater likelihood of college attendance.

The findings indicate that status attainment and social reproduction explanations of stratification remain relevant for understanding college enrollment. However, while status attainment explanations like parental aspirations and socioeconomic status, are positively associated with the likelihood of college enrollment in all contexts, social reproduction is less effective for explaining variation in some contexts, namely urban places. Institutions of higher education have instituted new policies to address information gaps that some students without supportive parents or robust social capital may suffer as recent research indicates (Hoxby and Avery 2012) high-achieving, low-income students are underrepresented in the larger higher education landscape. Scholars studying the intergenerational transmission of socioeconomic disadvantages for poor, urban neighborhoods have found evidence of limited upward social mobility for resource-poor students (Sharkey 2008). Students with the fewest socioeconomic advantages typically face adversity in schools and in this analysis, they have the least resources that would theoretically help overcome their existing social class status to ultimately enroll in post-secondary education. While there is scholarship on who applies to college and how students experience college life, we know less about how these college graduates benefit from their education. Brand and Xie (2010) examine who benefits most from higher education in terms of future earnings and show that those students benefiting the most are also least likely to apply. When we layer the importance of context, the students with the fewest socioeconomic advantages in the least advantaged geographic context have even greater challenges to overcome in persistence through school before they negotiate the transition to post-secondary opportunities. There is evidence in urban contexts that intervention in the college application process for students without familial support results in a greater likelihood of college enrollment (Roderick 2011). The finding regarding the relevance of status attainment theories for all spatial contexts

provides an important entry point for policymakers or education reformers seeking to equalize opportunities for students.

While I expected to see relationships between demographic factors, cognitive factors like student achievement and the likelihood of college attendance, I show support for the relevance of noncognitive factors and extracurricular engagement in predicting the likelihood of college attendance. The benefits of these factors, however, are not universal and vary depending on the educational outcome in question and students' spatial context. For instance, parent-child social capital is associated with suburban tenth grade math achievement and intergenerational closure predicts variation in test score gains for urban and suburban students. Beyond noncognitive factors, I show variation in the extracurricular engagement. Nearly across the board, problem behavior was negatively associated with student outcomes, but involvement with sports varied from context to context. Sport involvement significantly predicts lower tenth grade math achievement for urban and suburban students, but in rural contexts, greater engagement with athletics is positively associated with college attendance. While the literature addresses the importance of noncognitive resources and extracurricular engagement, in this analysis I add to the extant knowledge about these factors by showing their effects vary contextually.

In this project, I include two less traditional measures of stratification, proximity to nearest college and technological capital. These variables add to our understanding of spatial stratification because they bring in the importance of physical contact to higher education as well as access to technology. Traditionally, analyses have not considered proximity to post-secondary institution to understand variation in different student outcomes. There is evidence in this analysis that greater distance may depress some educational outcomes for some students. Though distance did not significantly predict variation in students' college-going aspirations, this

measure adds to our understanding of variation in both math achievement (in Chapter 6) and the likelihood of college attendance (in Chapter 7). Though the measure of distance was not significant in the pooled analyses of math achievement, in the contextual models I show that greater distance was associated with lower tenth grade math achievement for suburban students and lower test score gains for urban and suburban students. In the pooled models for college attendance, we see a negative relationship between distance and the likelihood of attendance a two-year institution. However in the contextual models, we see that as distance increased, the likelihood of suburban students' two-year or four-year college attendance decreases. Suburban students live closer than their rural peers, on average, to a post-secondary institution, so it is not clear why these significant effects do not extend to rural peers.

Technological capital is increasingly important to our understanding of school success in the sociology of education literature. Technology democratizes access to information, and students get the opportunity to build technological competencies as well. While the ELS respondents have grown up in more of a technological era, we cannot simply assume that they are totally technologically savvy. Having technological capital provides students with the chance to excel in their schoolwork and to connect with others outside of their spatial context. This variable captures students' access to computers and the Internet. Across all contexts and throughout the analysis, technological capital was overwhelmingly and positively related to students' school outcomes. Students with greater technological capital were more likely to foster college-going aspirations, had higher tenth grade math achievement and were more likely to enroll in either two-year or four-year institution.[32] Technological capital was not significantly associated with math test score gains for rural students. It is possible that expanding access to

[32] The only exception was for rural students enrolled in two-year schools.

technology in rural contexts could improve students' cognitive growth during the last two years of high school when they are focused on post-secondary opportunities. While I could not test whether students use their technological capital to access information regarding higher education, I do show that on its face, technological capital is an important predictor of school success. Both technological capital and distance to nearest institution are critical factors to consider in future analyses of college preparedness and access.

Among other notable substantive findings, peer engagement is a main predictor of whether students' aspire to college, exhibit high achievement, and ultimately pursue post-secondary education of some sort. This finding presents a new opportunity for education reformers looking to improve students' achievement. While many individual or school factors are necessary for understanding how student achievement could vary along spatial context, education policy rarely addresses the relevance of these out of classroom experiences for building noncognitive resources and for predicting better student outcomes in urban, suburban and rural places. I explore several extracurricular engagement opportunities to explain how students could endorse positive rewards of education and how students disengage from school, engaging in "risky" behaviors. I also include a measure of peer social capital to examine how peers' endorsement of positive school habits serves as a positive influence in students' school lives.

Engagement in the extra-curriculum is necessary both for building noncognitive resources and for predicting variation in students' outcomes like aspirations, achievement and ultimate college attendance. Engagement with peers is an important dimension of fostering college-going aspirations in the analysis in Chapter 5. Students with greater peer social capital and involvement in positive activities (like club activities or athletics) and aversion to

delinquency were more likely to have college-going aspirations. Engagement with school clubs is positively associated with college-going aspirations, math achievement, and the likelihood of attending a four-year college. Engagement with problem behavior was overwhelmingly negatively associated with these outcomes. Peer social capital, however, exerted fewer significant effects in these models. While students may buy into the educational rewards associated with studying and resisting peer pressure to engage in "delinquent" behavior, peer social capital was not as significantly related to the outcomes in this analysis. All of these findings regarding extracurricular engagement and students' achievement and post-secondary attainment call attention to the importance of experiences outside of the classroom.

These analyses are not without several limitations. First, though I assume college enrollment as a straight-line trajectory, the pursuit of higher education can be more complex. The ELS provides the highest level of education attained by each respondent but we do not know whether their transition from high school to college was immediate. Students reporting their highest level of education may not have started their post-secondary education at their current institution. It is common for high school students to enroll in their local community college to take introductory courses before transferring to another institution. This data cannot account for students who enrolled in a community college or other two-year institution before enrolling in a four-year institution. Additionally, I cannot account for students who took several gap years rather than a single gap year but then eventually pursued higher education at either a two-year or four-year institution.

Additionally, I have restricted the sample to public school students. Pragmatically, there are too few private school students in rural areas to make comparisons across school types. It is possible that urban or suburban students avail themselves of private school options, leaving

fewer of the highest achievers in these respective samples and thus potentially skewing student achievement data. The quality of public school options can vary greatly across spatial contexts and though I use standardized test scores to evaluate cognitive ability, it is also necessary to highlight the potential internal variation in each spatial context. Beyond the restriction to public school students, I have controlled for average class size using a measure of student/teacher ratio in these analyses, however, other school characteristics like school size or school type vary considerably within each spatial context. While I have controlled for school characteristics that signal the academic rigor or school resources available to students, I do not control further for features of the spatial context. I make broad comparisons across these spatial contexts but it is possible that some smaller urban contexts resemble larger suburban contexts. I do not control for features of the spatial context that would distinguish between seemingly similar thought slightly different spatial contexts.

While this project is ultimately focused on the spatial stratification of college attendance, dissecting the factors involved in the process sheds light on important entry points for future policy and intervention. Much of the existing K-12 education policy focuses solely on improving student achievement. Simple improvements in high school achievement will not necessarily lead to equalizing access to post-secondary opportunities. In this project, I show that student achievement is one of several important predictors of the likelihood of college attendance. To improve rates of college attendance, we must address achievement *and* noncognitive resources (Hoover 2013).

This analysis provides some support for research on the intergenerational transmission of wealth and the importance of understanding how certain disadvantages, namely social class, hold some students back. This finding is important for understanding contextual deficits for two

reasons. First, policies aimed to equalize access to post-secondary institutions that only address school issues fall short of addressing spatial context. And secondly, socioeconomic status is associated with the forms of social capital necessary to form high aspirations and this process does not happen in schools. So policies that do not address these noncognitive skills will also fall short in equalizing opportunities. This finding is important for understanding how to keep students engaged in school life. Few scholars have explored this relationship looking at students in specific geographic contexts. Carr and Kefalas (2009) show that rural places only invest in those with academic ability but this analysis shows that fostering post-secondary aspirations among students is related to higher achievement. If different geographic contexts were interested in bridging the secondary and post-secondary contexts, they could focus on developing these aspirations in students.

When students lack certain noncognitive resources, they are at a disadvantage in the college application process. The present analysis provides support for the adoption of education reforms aimed at addressing these college preparedness gaps strategically and spatially. That is, the reform may be more successful if they are specific to a spatial context. In suburban contexts, we see greater enrollment in college-preparatory courses is positively associated with test score gains and the likelihood of four-year enrollment. In rural places, students attending schools with more full-time certified teachers were more likely to enroll in four-year colleges. If rural schools can leverage this teacher talent to provide the college-preparatory courses so important for suburban students' likelihood of college attendance, rural administrators could facilitate students' pursuit of post-secondary education more easily.

Targeted reform efforts dedicated to college preparatory efforts are already at work outside of schools. Nonprofit organizations working to improve college attendance rates among

urban high school students, like the Posse Foundation or the Hartford Youth Scholars Foundation, identify academically promising students in urban contexts and prepare them for rigors of college level work and leadership. These students often lack the parental support or noncognitive resources necessary to negotiate the college application process. These programs operate at a smaller scale that federal or state education reform, and they address the needs of urban students but not rural or suburban students. Similar programs for rural students, like the Rural Connections programs at Johns Hopkins Center for Talented Youth, plan to provide enrichment middle school students, but their administrators have struggled to identify eligible youth in rural places. One shortcoming of these kinds of programs is that they support college attendance but there is no guarantee students will return to their home communities and build the noncognitive resources necessary to support their peers.

Another important remedy for social class stratification in higher education is the availability of financial aid and recruitment programs that engage students from low socioeconomic backgrounds. The availability of Pell Grants and other federal programs supporting students' pursuit of higher education have come under scrutiny, but without these important funding sources, many students will be unable to consider post-secondary education (Baum and Schwartz 2012). The President has launched a new initiative, The College Scorecard, to provide information to students and their families about higher education as an investment. Simply disseminating information about college affordability does not necessarily incentivize students to apply and pursue post-secondary education (Luna De La Rosa 2006). Rather, drastic changes in the way that colleges provide financial support to traditionally disadvantaged groups will help democratize access (Haveman and Smeeding 2006). Beyond financial incentives, though, scholars show that greater institutional support is necessary to help

these under-represented students transition through and ultimately graduate from their institution of higher education.

Policy reform often treats higher education credentials as though they are all equal regardless of the type of institution students attend. This analysis shows that the factors predicting two-year enrollment vary from the factors predicting four-year enrollment from the pooled models to the contextual models. It is unclear in the literature how each institution prepares students for labor market opportunities, and because of this greater attention must be paid in the literature to the benefits of specific post-secondary opportunities. As reforms work to address contextual deficits in college preparedness and access, it is also crucial to recognize that institutions of higher education produce different opportunities depending on the kind of credential they ultimately obtain.

The American system of higher education faces greater accountability to students and families as the cost of attending rises and as the labor market remains stagnant. In this project, I examined the likelihood of college attendance with a special focus on the impact of spatial context to understand how two-year and four-year college enrollment rates vary. By keeping it in context, I show significant differences in the factors we traditionally use to predict college enrollment as well as variation in enrollment rates by spatial context. It is my hope that future research considers spatial stratification as centrally as this analysis in order to equalize access to post-secondary opportunities for students regardless of their spatial context.

**Appendix A: Construction of Indices for Technological Capital and Social Capital Measures**

| Measure | Response Range | Item | Minimum | Maximum |
|---|---|---|---|---|
| ***Technological Capital*** | | | | |
| Family has a computer | No or yes (0-1) | BYS84B | 0 | 1 |
| Family has access to the internet | No or yes (0-1) | BYS84D | 0 | 1 |
| | | | **Alpha** | **0.7888** |
| ***Intergenerational Closure*** | | | | |
| Friend's parent gave advice about teachers/courses | None to more than four times | BYP60A | 0 | 3 |
| Friend's parent did favor | None to more than four times | BYP60B | 0 | 3 |
| Friend's parent received favor | None to more than four times | BYP60C | 0 | 3 |
| Friend's parent supervised 10th grader on field trip | None to more than four times | BYP60D | 0 | 3 |
| | | | **Alpha** | **0.7359** |
| ***Parent-Child Social Capital*** | | | | |
| Parent attended school activities with 10th grader | Never to frequently (0-3) | BYP57A | 0 | 3 |
| Parent worked on homework/school projects with 10th grader | Never to frequently (0-3) | BYP57B | 0 | 3 |
| Parent attended concerts/plays/movies with 10th grader | Never to frequently (0-3) | BYP57C | 0 | 3 |
| Parent attended sports events outside school with 10th grader | Never to frequently (0-3) | BYP57D | 0 | 3 |
| Parent attended religious services with 10th grader | Never to frequently (0-3) | BYP57E | 0 | 3 |
| Parent attended family social functions with 10th grader | Never to frequently (0-3) | BYP57F | 0 | 3 |
| Parent took day trips/vacations with 10th grader | Never to frequently (0-3) | BYP57G | 0 | 3 |
| Parent worked on hobby/played sports with 10th grader | Never to frequently (0-3) | BYP57H | 0 | 3 |
| Parent went shopping with 10th grader | Never to frequently (0-3) | BYP57I | 0 | 3 |
| Parent went to restaurants with 10th grader | Never to frequently (0-3) | BYP57J | 0 | 3 |
| Parent spent time talking with 10th grader | Never to frequently (0-3) | BYP57K | 0 | 3 |
| Parent did something else fun with 10th grader | Never to frequently (0-3) | BYP57L | 0 | 3 |
| | | | **Alpha** | **0.8189** |
| ***Peer Social Capital*** | | | | |
| Among your close friends, how important is it to them that they study | Not at all important to Very important (1-3) | BYS90B | 1 | 3 |
| Among your close friends, how important is it to them that they get good grades. | Not at all important to Very important (1-3) | BYS90D | 1 | 3 |
| Among your closest friends, how important is it to them that they graduate from high school? | Not at all important to Very important (1-3) | BYS90F | 1 | 3 |
| | | | **Alpha** | **0.7262** |

**Appendix B: Construction of Indices for Key Independent Variables**

| Measure | Response Range | Item | Minimum | Maximum |
|---|---|---|---|---|
| ***Problem Behavior*** | | | | |
| How many times late for school | Never to ten or more times (0-4) | BYS24A | 0 | 4 |
| How many times cut/skip classes | Never to ten or more times (0-4) | BYS24B | 0 | 4 |
| How many times absent from school | Never to ten or more times (0-4) | BYS24C | 0 | 4 |
| How many times got in trouble | Never to ten or more times (0-4) | BYS24D | 0 | 4 |
| How many times put on in-school suspension | Never to ten or more times (0-4) | BYS24E | 0 | 4 |
| How many times suspended/put on probation | Never to ten or more times (0-4) | BYS24F | 0 | 4 |
| How many times transferred for disciplinary reasons | Never to ten or more times (0-4) | BYS24G | 0 | 4 |
| | | | **Alpha** | **0.7434** |
| ***Club Engagement*** | | | | |
| Participated in school band or chorus | No or yes (0-1) | BYS41A | 0 | 1 |
| Participated in school play or musical | No or yes (0-1) | BYS41B | 0 | 1 |
| Participated in student government | No or yes (0-1) | BYS41C | 0 | 1 |
| Participated in academic honor society | No or yes (0-1) | BYS41D | 0 | 1 |
| Participated in school yearbook or newspaper | No or yes (0-1) | BYS41E | 0 | 1 |
| Participated in school service clubs | No or yes (0-1) | BYS41F | 0 | 1 |
| Participated in school academic clubs | No or yes (0-1) | BYS41G | 0 | 1 |
| Participated in school hobby clubs | No or yes (0-1) | BYS41H | 0 | 1 |
| Participated in school vocational clubs | No or yes (0-1) | BYS41I | 0 | 1 |
| | | | **Total** | 9 |
| ***Sport Engagement*** | | | | |
| Did not participate in interscholastic baseball | Participated to not participated (0-1) | BYS40AB | 0 | 1 |
| Did not participate in interscholastic softball | Participated to not participated (0-1) | BYS40BB | 0 | 1 |
| Did not participate in interscholastic basketball | Participated to not participated (0-1) | BYS40CB | 0 | 1 |
| Did not participate in interscholastic football | Participated to not participated (0-1) | BYS40DB | 0 | 1 |
| Did not participate in interscholastic soccer | Participated to not participated (0-1) | BYS40EB | 0 | 1 |
| Did not participate in other interscholastic team sport | Participated to not participated (0-1) | BYS40FB | 0 | 1 |
| Did not participate in interscholastic individual sport | Participated to not participated (0-1) | BYS40GB | 0 | 1 |
| Did not participate on interscholastic cheerleading/drill t | Participated to not participated (0-1) | BYS40HB | 0 | 1 |
| | | | **Total** | 6 |

**Appendix C: Pooled analysis of noncognitive resources, spatial context**

| | Technological Capital | | Parental Aspirations | | Intergenerational Closure | | Parent-Child Social Capital | | Peer Social Capital | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. |
| **Spatial Context** | | | | | | | | | | |
| Urban | -0.146 | 0.043 ** | 0.753 | 0.083 *** | -0.129 | 0.027 *** | -0.161 | 0.023 *** | 0.061 | 0.031 + |
| Suburb | 0.032 | 0.035 | 0.378 | 0.074 *** | -0.034 | 0.023 | -0.056 | 0.017 ** | 0.032 | 0.027 |
| ***Constant*** | -0.056 | 0.028 * | 0.990 | 0.056 *** | -0.012 | 0.018 | 0.034 | 0.013 | -0.074 | 0.022 ** |
| *N* | 10,110 | | 12,310 | | 9,200 | | 9,350 | | 8,130 | |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

**Appendix D: Pooled analysis of noncognitive resources, spatial context and extracurricular engagement**

| | Technological Capital | | Parental Aspirations | | Intergenerational Closure | | Parent-Child Social Capital | | Peer Social Capital | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. |
| **Spatial Context** | | | | | | | | | | |
| Urban | -0.113 | 0.042 ** | 0.899 | 0.087 *** | -0.094 | 0.027 *** | -0.129 | 0.023 *** | 0.114 | 0.030 *** |
| Suburb | 0.046 | 0.035 | 0.451 | 0.079 ** | -0.009 | 0.023 | -0.031 | 0.017 + | 0.054 | 0.026 * |
| **Extracurriculum** | | | | | | | | | | |
| Problem Behavior | -0.165 | 0.020 *** | -0.448 | 0.037 *** | -0.061 | 0.012 *** | -0.061 | 0.010 *** | -0.281 | 0.018 *** |
| Activity Involvement | 0.053 | 0.008 *** | 0.236 | 0.022 *** | 0.048 | 0.007 *** | 0.037 | 0.005 *** | 0.079 | 0.007 *** |
| Sport Involvement | -0.003 | 0.011 | 0.036 | 0.025 | 0.046 | 0.008 *** | 0.048 | 0.006 *** | 0.014 | 0.009 |
| ***Constant*** | -0.117 | 0.031 *** | 0.741 | 0.068 *** | -0.113 | 0.021 *** | -0.057 | 0.015 *** | -0.179 | 0.023 *** |
| *N* | 10,110 | | 12,310 | | 9,200 | | 9,350 | | 8,130 | |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

**Appendix E: Pooled analysis of noncognitive resources, spatial context, extracurricular engagement and individual factors**

| | Technological Capital | | Parental Aspirations | | Intergenerational Closure | | Parent-Child Social Capital | | Peer Social Capital | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. | $\beta$ | S.E. |
| **Spatial Context** | | | | | | | | | | |
| Urban | -0.001 | 0.033 | 0.692 | 0.085 *** | -0.037 | 0.026 | -0.088 | 0.019 *** | 0.037 | 0.030 |
| Suburb | 0.015 | 0.025 | 0.295 | 0.069 *** | 0.002 | 0.022 | -0.029 | 0.015 + | 0.019 | 0.025 |
| **Extracurriculum** | | | | | | | | | | |
| Problem Behavior | -0.084 | 0.019 *** | -0.381 | 0.036 *** | -0.041 | 0.012 ** | -0.047 | 0.010 *** | -0.264 | 0.018 *** |
| Activity Involvement | 0.012 | 0.007 + | 0.163 | 0.022 *** | 0.034 | 0.007 *** | 0.021 | 0.005 *** | 0.060 | 0.007 *** |
| Sport Involvement | 0.004 | 0.010 | 0.054 | 0.024 * | 0.043 | 0.008 *** | 0.044 | 0.006 *** | 0.020 | 0.009 |
| **Individual Factors** | | | | | | | | | | |
| Female | -0.018 | 0.018 | 0.235 | 0.050 *** | 0.030 | 0.016 + | 0.070 | 0.012 *** | 0.186 | 0.019 *** |
| Hispanic | -0.274 | 0.039 *** | 0.538 | 0.084 *** | -0.096 | 0.022 *** | 0.053 | 0.019 ** | 0.160 | 0.029 *** |
| Black | -0.302 | 0.038 *** | 0.452 | 0.080 *** | 0.021 | 0.029 | 0.136 | 0.020 *** | 0.200 | 0.032 *** |
| Asian | 0.116 | 0.029 *** | 1.588 | 0.145 *** | -0.200 | 0.028 *** | -0.362 | 0.026 *** | 0.170 | 0.030 *** |
| Socioeconomic status | 0.347 | 0.016 *** | 0.694 | 0.039 *** | 0.136 | 0.011 *** | 0.189 | 0.010 *** | 0.086 | 0.014 *** |
| South | -0.064 | 0.022 ** | 0.118 | 0.058 * | 0.044 | 0.018 * | 0.053 | 0.013 *** | 0.040 | 0.023 + |
| Two-parent | 0.138 | 0.025 *** | 0.002 | 0.059 | 0.031 | 0.019 | 0.064 | 0.016 *** | 0.021 | 0.022 |
| Number of siblings | -0.049 | 0.008 *** | -0.022 | 0.017 | -0.009 | 0.005 | -0.023 | 0.004 *** | 0.001 | 0.007 |
| Mobility | -0.016 | 0.008 + | -0.020 | 0.017 | -0.028 | 0.005 *** | -0.014 | 0.004 ** | -0.020 | 0.007 ** |
| ***Constant*** | 0.055 | 0.038 | 0.730 | 0.094 *** | -0.079 | 0.031 * | -0.067 | 0.023 ** | -0.297 | 0.036 *** |
| *N* | 10,110 | | 12,310 | | 9,200 | | 9,350 | | 8,130 | |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

**Appendix F: Pooled Analysis of Technological Capital including selected interaction terms**

| | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | | | | |
| Urban | 0.033 | 0.042 | | -0.009 | 0.045 | | -0.004 | 0.055 | | -0.045 | 0.057 | | 0.021 | 0.034 | | -0.117 | 0.078 | |
| Suburban | 0.040 | 0.032 | | -0.010 | 0.035 | | 0.039 | 0.031 | | -0.006 | 0.041 | | 0.013 | 0.024 | | 0.004 | 0.055 | |
| **Extracurriculum** | | | | | | | | | | | | | | | |
| Problem Behavior | -0.090 | 0.020 | *** | -0.084 | 0.019 | *** | -0.084 | 0.019 | *** | -0.088 | 0.021 | *** | -0.084 | 0.019 | *** | -0.092 | 0.021 | *** |
| Activity Involvement | 0.012 | 0.008 | | 0.015 | 0.007 | * | 0.015 | 0.007 | * | 0.017 | 0.007 | * | 0.015 | 0.007 | * | 0.014 | 0.008 | + |
| Sport Involvement | 0.028 | 0.019 | | 0.011 | 0.010 | | 0.011 | 0.010 | | 0.011 | 0.011 | | 0.011 | 0.010 | | 0.033 | 0.020 | |
| **Individual Factors** | | | | | | | | | | | | | | | |
| Female | -0.029 | 0.019 | | -0.064 | 0.040 | | -0.020 | 0.018 | | -0.018 | 0.020 | | -0.020 | 0.018 | | -0.088 | 0.043 | |
| Hispanic | -0.248 | 0.041 | *** | -0.241 | 0.039 | *** | -0.239 | 0.039 | *** | -0.244 | 0.042 | *** | -0.246 | 0.040 | *** | -0.265 | 0.044 | *** |
| Black | -0.284 | 0.042 | *** | -0.262 | 0.039 | *** | -0.264 | 0.040 | *** | -0.260 | 0.042 | *** | -0.264 | 0.039 | *** | -0.287 | 0.044 | *** |
| Asian | 0.111 | 0.034 | ** | 0.116 | 0.033 | *** | 0.117 | 0.033 | *** | 0.123 | 0.034 | *** | 0.114 | 0.033 | *** | 0.115 | 0.034 | ** |
| Socioeconomic status | 0.314 | 0.017 | *** | 0.316 | 0.016 | *** | 0.317 | 0.016 | *** | 0.315 | 0.017 | *** | 0.370 | 0.032 | *** | 0.362 | 0.036 | *** |
| South | -0.041 | 0.025 | | -0.034 | 0.024 | | -0.032 | 0.024 | | -0.022 | 0.025 | | -0.032 | 0.024 | | -0.034 | 0.026 | |
| Two-parent | 0.128 | 0.026 | *** | 0.134 | 0.025 | *** | 0.135 | 0.025 | *** | 0.131 | 0.027 | *** | 0.135 | 0.025 | *** | 0.126 | 0.028 | *** |
| Number of siblings | -0.044 | 0.008 | *** | -0.045 | 0.008 | *** | -0.045 | 0.008 | *** | -0.043 | 0.008 | *** | -0.045 | 0.008 | *** | -0.045 | 0.008 | *** |
| Mobility | -0.017 | 0.009 | + | -0.017 | 0.008 | * | -0.017 | 0.008 | * | -0.019 | 0.009 | * | -0.017 | 0.008 | * | -0.017 | 0.010 | |
| **School Factors** | | | | | | | | | | | | | | | |
| Percent Minority | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.002 | 0.001 | |
| Student/Teacher ratio | 0.005 | 0.003 | + | 0.004 | 0.003 | | 0.004 | 0.003 | | 0.005 | 0.003 | + | 0.004 | 0.003 | | 0.007 | 0.003 | * |
| School Poverty | -0.004 | 0.001 | *** | -0.004 | 0.001 | *** | -0.004 | 0.001 | *** | -0.005 | 0.002 | ** | -0.004 | 0.001 | *** | -0.006 | 0.002 | ** |
| % FT Certified Teachers | -0.001 | 0.001 | | -0.001 | 0.001 | | -0.001 | 0.001 | | -0.001 | 0.001 | | -0.001 | 0.001 | | -0.001 | 0.001 | |
| % College Prep | 0.001 | 0.000 | + | 0.001 | 0.000 | + | 0.001 | 0.000 | + | 0.001 | 0.000 | * | 0.001 | 0.000 | + | 0.001 | 0.000 | * |
| % Vocational | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | |
| **Interactions** | | | | | | | | | | | | | | | |
| Sport*Urb | -0.016 | 0.025 | | | | | | | | | | | | | | -0.017 | 0.026 | |
| Sport*Sub | -0.030 | 0.023 | | | | | | | | | | | | | | -0.042 | 0.024 | + |
| Female*Urb | | | | 0.067 | 0.054 | | | | | | | | | | | 0.089 | 0.059 | |
| Female*Sub | | | | 0.050 | 0.046 | | | | | | | | | | | 0.066 | 0.050 | |
| Percent Minority*Urb | | | | | | | 0.000 | 0.001 | | | | | | | | 0.000 | 0.002 | |
| Percent Minority*Sub | | | | | | | -0.001 | 0.001 | | | | | | | | -0.002 | 0.001 | + |
| Sch Poverty*Urban | | | | | | | | | | 0.003 | 0.002 | | | | | 0.002 | 0.003 | |
| Sch Poverty*Sub | | | | | | | | | | 0.001 | 0.002 | | | | | 0.003 | 0.002 | |
| SES*Urb | | | | | | | | | | | | | -0.080 | 0.044 | + | -0.055 | 0.051 | |
| SES*Sub | | | | | | | | | | | | | -0.061 | 0.038 | | -0.063 | 0.043 | |
| ***Constant*** | 0.094 | 0.141 | | 0.121 | 0.138 | | 0.076 | 0.139 | | 0.074 | 0.140 | | 0.094 | 0.137 | | 0.085 | 0.151 | |

**Note:** Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

*N* = 10,110

**Appendix G: Pooled Analysis of Parental Aspirations including selected interaction terms**

| | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | |
| Urban | 0.307 | 0.091 | ** | 0.412 | 0.143 | ** | 0.378 | 0.093 | *** | 0.289 | 0.144 | * | 0.244 | 0.193 | |
| Suburban | 0.158 | 0.069 | * | 0.208 | 0.125 | + | 0.208 | 0.070 | ** | 0.144 | 0.093 | | 0.106 | 0.151 | |
| **Extracurriculum** | | | | | | | | | | | | | | | |
| Problem Behavior | -0.386 | 0.038 | *** | -0.388 | 0.038 | *** | -0.274 | 0.072 | *** | -0.387 | 0.037 | *** | -0.268 | 0.073 | *** |
| Activity Involvement | 0.172 | 0.024 | *** | 0.171 | 0.024 | *** | 0.160 | 0.024 | *** | 0.175 | 0.023 | *** | 0.159 | 0.024 | *** |
| Sport Involvement | 0.082 | 0.023 | *** | 0.081 | 0.024 | ** | 0.084 | 0.023 | *** | 0.075 | 0.024 | ** | 0.084 | 0.023 | *** |
| **Individual Factors** | | | | | | | | | | | | | | | |
| Female | 0.440 | 0.051 | *** | 0.435 | 0.051 | *** | 0.444 | 0.052 | *** | 0.272 | 0.051 | *** | 0.444 | 0.052 | *** |
| Hispanic | 0.614 | 0.090 | *** | 0.647 | 0.091 | *** | 0.607 | 0.094 | *** | 0.259 | 0.087 | ** | 0.580 | 0.094 | *** |
| Black | 0.554 | 0.085 | *** | 0.571 | 0.086 | *** | 0.565 | 0.088 | *** | 0.231 | 0.085 | ** | 0.559 | 0.088 | *** |
| Asian | 1.668 | 0.148 | *** | 1.710 | 0.151 | *** | 1.694 | 0.157 | *** | 1.352 | 0.151 | *** | 1.660 | 0.154 | *** |
| Socioeconomic status | 0.865 | 0.073 | *** | 0.750 | 0.040 | *** | 0.747 | 0.042 | *** | 0.675 | 0.039 | *** | 0.845 | 0.075 | *** |
| South | 0.152 | 0.061 | * | 0.139 | 0.061 | * | 0.137 | 0.063 | * | 0.078 | 0.061 | | 0.157 | 0.064 | * |
| Two-parent | 0.009 | 0.060 | | 0.043 | 0.121 | | 0.018 | 0.061 | | 0.007 | 0.059 | | 0.010 | 0.129 | |
| Number of siblings | -0.028 | 0.017 | | -0.028 | 0.017 | | -0.025 | 0.018 | | -0.021 | 0.017 | | -0.026 | 0.018 | |
| Mobility | -0.027 | 0.017 | | -0.030 | 0.017 | + | -0.028 | 0.018 | | -0.025 | 0.017 | | -0.027 | 0.018 | |
| **School Factors** | | | | | | | | | | | | | | | |
| Percent Minority | 0.005 | 0.001 | ** | 0.005 | 0.001 | ** | 0.005 | 0.002 | ** | 0.009 | 0.003 | ** | 0.002 | 0.002 | |
| Student/Teacher ratio | 0.015 | 0.008 | + | 0.016 | 0.008 | + | 0.013 | 0.009 | | 0.025 | 0.008 | ** | 0.013 | 0.008 | |
| School Poverty | -0.002 | 0.002 | | -0.002 | 0.002 | | -0.002 | 0.002 | | -0.004 | 0.002 | + | -0.002 | 0.002 | |
| % FT Certified Teachers | -0.004 | 0.003 | | -0.005 | 0.003 | + | -0.004 | 0.003 | | -0.004 | 0.003 | | -0.004 | 0.003 | |
| % College Prep | 0.004 | 0.001 | *** | 0.004 | 0.001 | *** | 0.004 | 0.001 | *** | 0.004 | 0.001 | *** | 0.004 | 0.001 | *** |
| % Vocational | -0.003 | 0.002 | + | -0.003 | 0.002 | + | -0.003 | 0.002 | + | -0.003 | 0.002 | | -0.003 | 0.002 | + |
| **Interactions** | | | | | | | | | | | | | | | |
| SES*Urb | -0.282 | 0.101 | ** | | | | | | | | | | -0.260 | 0.106 | * |
| SES*Sub | -0.092 | 0.088 | | | | | | | | | | | -0.064 | 0.092 | |
| Two-Parent*Urb | | | | -0.049 | 0.160 | | | | | | | | 0.023 | 0.168 | |
| Two-Parent*Sub | | | | -0.052 | 0.146 | | | | | | | | 0.002 | 0.156 | |
| Problem Behavior*Urb | | | | | | | -0.048 | 0.099 | | | | | -0.062 | 0.099 | |
| Problem Behavior*Sub | | | | | | | -0.193 | 0.090 | * | | | | -0.200 | 0.091 | * |
| Percent Minority*Urb | | | | | | | | | | 0.002 | 0.003 | | 0.003 | 0.003 | |
| Percent Minority*Sub | | | | | | | | | | 0.001 | 0.003 | | 0.004 | 0.002 | + |
| ***Constant*** | 0.539 | 0.342 | | 0.520 | 0.349 | *** | 0.552 | 0.349 | | 0.495 | 0.340 | | 0.579 | 0.361 | |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

*N* = 12,310

**Appendix H: Pooled Analysis of Intergenerational Closure including selected interaction terms**

| | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | | | | | | | |
| Urban | -0.009 | 0.029 | | -0.054 | 0.035 | | -0.031 | 0.046 | | 0.010 | 0.030 | | 0.020 | 0.118 | | -0.079 | 0.135 | |
| Suburban | 0.007 | 0.022 | | -0.014 | 0.028 | | -0.014 | 0.029 | | 0.017 | 0.023 | | -0.108 | 0.093 | | -0.115 | 0.102 | |
| **Extracurriculum** | | | | | | | | | | | | | | | | | | |
| Problem Behavior | -0.040 | 0.012 | ** | -0.040 | 0.012 | ** | -0.041 | 0.012 | ** | -0.071 | 0.022 | ** | -0.040 | 0.012 | ** | -0.058 | 0.022 | ** |
| Activity Involvement | 0.034 | 0.007 | *** | 0.033 | 0.007 | *** | 0.033 | 0.007 | *** | 0.034 | 0.007 | *** | 0.033 | 0.007 | *** | 0.033 | 0.007 | *** |
| Sport Involvement | 0.045 | 0.008 | *** | 0.045 | 0.008 | *** | 0.045 | 0.008 | *** | 0.044 | 0.008 | *** | 0.043 | 0.008 | *** | 0.042 | 0.008 | *** |
| **Individual Factors** | | | | | | | | | | | | | | | | | | |
| Female | 0.029 | 0.016 | + | 0.030 | 0.016 | + | 0.030 | 0.016 | + | 0.025 | 0.016 | | 0.035 | 0.016 | * | 0.031 | 0.016 | + |
| Hispanic | -0.083 | 0.025 | ** | -0.072 | 0.025 | ** | -0.075 | 0.025 | ** | -0.089 | 0.026 | ** | -0.075 | 0.026 | ** | -0.092 | 0.027 | ** |
| Black | 0.034 | 0.030 | | 0.042 | 0.030 | | 0.041 | 0.030 | | 0.035 | 0.030 | | 0.046 | 0.031 | | 0.040 | 0.031 | |
| Asian | -0.184 | 0.029 | *** | -0.173 | 0.029 | *** | -0.179 | 0.029 | *** | -0.185 | 0.029 | *** | -0.178 | 0.029 | *** | -0.180 | 0.030 | *** |
| Socioeconomic status | 0.159 | 0.025 | *** | 0.134 | 0.012 | *** | 0.135 | 0.012 | *** | 0.130 | 0.012 | *** | 0.132 | 0.012 | *** | 0.159 | 0.027 | *** |
| South | 0.071 | 0.020 | *** | 0.020 | 0.036 | | 0.072 | 0.020 | *** | 0.070 | 0.020 | ** | 0.067 | 0.020 | ** | 0.031 | 0.045 | |
| Two-parent | 0.027 | 0.019 | | 0.029 | 0.019 | | 0.029 | 0.019 | | 0.028 | 0.019 | | 0.032 | 0.019 | + | 0.029 | 0.020 | |
| Number of siblings | -0.009 | 0.005 | + | -0.009 | 0.005 | + | -0.009 | 0.005 | + | -0.011 | 0.005 | * | -0.009 | 0.005 | + | -0.012 | 0.005 | * |
| Mobility | -0.028 | 0.005 | *** | -0.028 | 0.005 | *** | -0.028 | 0.005 | *** | -0.028 | 0.005 | *** | -0.028 | 0.005 | *** | -0.027 | 0.005 | *** |
| **School Factors** | | | | | | | | | | | | | | | | | | |
| Percent Minority | -0.001 | 0.000 | ** | -0.001 | 0.000 | ** | -0.002 | 0.001 | * | -0.001 | 0.000 | ** | -0.002 | 0.001 | ** | -0.002 | 0.001 | + |
| Student/Teacher ratio | 0.002 | 0.003 | | 0.002 | 0.003 | | 0.002 | 0.003 | | 0.002 | 0.003 | | -0.001 | 0.005 | | 0.000 | 0.005 | |
| School Poverty | 0.001 | 0.001 | | 0.001 | 0.001 | | 0.001 | 0.001 | | 0.001 | 0.001 | + | 0.001 | 0.001 | | 0.002 | 0.001 | + |
| % FT Certified Teachers | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | |
| % College Prep | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | |
| % Vocational | -0.001 | 0.000 | ** | -0.001 | 0.000 | ** | -0.001 | 0.000 | ** | -0.001 | 0.000 | ** | -0.001 | 0.000 | * | -0.001 | 0.000 | * |
| **Interactions** | | | | | | | | | | | | | | | | | | |
| SES*Urb | -0.043 | 0.032 | | | | | | | | | | | | | | -0.043 | 0.034 | |
| SES*Sub | -0.028 | 0.028 | | | | | | | | | | | | | | -0.036 | 0.030 | |
| South*Urb | | | | 0.097 | 0.051 | + | | | | | | | | | | 0.107 | 0.062 | + |
| South*Sub | | | | 0.049 | 0.044 | | | | | | | | | | | 0.028 | 0.053 | |
| Percent Minority*Urb | | | | | | | 0.001 | 0.001 | | | | | | | | 0.001 | 0.001 | |
| Percent Minority*Sub | | | | | | | 0.001 | 0.001 | | | | | | | | 0.001 | 0.001 | |
| Problem Behavior*Urb | | | | | | | | | | 0.039 | 0.030 | | | | | 0.022 | 0.030 | |
| Problem Behavior*Sub | | | | | | | | | | 0.033 | 0.027 | | | | | 0.019 | 0.027 | |
| Student/Teacher ratio*Urb | | | | | | | | | | | | | -0.001 | 0.007 | | 0.002 | 0.007 | |
| Student/Teacher ratio*Sub | | | | | | | | | | | | | 0.007 | 0.006 | | 0.006 | 0.006 | |
| ***Constant*** | -0.110 | 0.100 | | -0.096 | 0.102 | | -0.104 | 0.101 | | -0.091 | 0.106 | | -0.052 | 0.118 | | -0.016 | 0.125 | |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

*N* = 9,200

**Appendix I: Pooled Analysis of Parent-Child Social Capital including selected interaction terms**

| | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | | | | | | | |
| Urban | -0.061 | 0.022 | ** | -0.086 | 0.028 | ** | -0.087 | 0.038 | * | -0.059 | 0.023 | ** | -0.072 | 0.027 | ** | -0.062 | 0.034 | + | -0.079 | 0.059 | |
| Suburban | -0.016 | 0.016 | | -0.027 | 0.020 | | -0.060 | 0.032 | + | -0.012 | 0.017 | | -0.034 | 0.021 | | -0.037 | 0.024 | | -0.116 | 0.044 | ** |
| **Extracurriculum** | | | | | | | | | | | | | | | | | | | | | |
| Problem Behavior | -0.046 | 0.010 | *** | -0.046 | 0.010 | *** | -0.046 | 0.010 | *** | -0.068 | 0.019 | *** | -0.048 | 0.011 | *** | -0.043 | 0.011 | *** | -0.063 | 0.021 | ** |
| Activity Involvement | 0.021 | 0.005 | *** | 0.020 | 0.005 | *** | 0.020 | 0.005 | *** | 0.019 | 0.005 | *** | 0.012 | 0.009 | | 0.020 | 0.005 | *** | 0.012 | 0.009 | |
| Sport Involvement | 0.042 | 0.006 | *** | 0.042 | 0.006 | *** | 0.042 | 0.006 | *** | 0.043 | 0.006 | *** | 0.042 | 0.006 | *** | 0.038 | 0.006 | *** | 0.039 | 0.006 | *** |
| **Individual Factors** | | | | | | | | | | | | | | | | | | | | | |
| Female | 0.070 | 0.012 | *** | 0.070 | 0.012 | *** | 0.070 | 0.012 | *** | 0.067 | 0.012 | *** | 0.067 | 0.013 | *** | 0.074 | 0.013 | *** | 0.069 | 0.013 | *** |
| Hispanic | 0.077 | 0.021 | *** | 0.078 | 0.021 | *** | 0.077 | 0.021 | *** | 0.077 | 0.021 | *** | 0.078 | 0.021 | *** | 0.073 | 0.021 | ** | 0.079 | 0.022 | *** |
| Black | 0.153 | 0.021 | *** | 0.155 | 0.021 | *** | 0.155 | 0.021 | *** | 0.157 | 0.022 | *** | 0.162 | 0.022 | *** | 0.157 | 0.022 | *** | 0.165 | 0.024 | *** |
| Asian | -0.332 | 0.027 | *** | -0.332 | 0.026 | *** | -0.335 | 0.026 | *** | -0.335 | 0.027 | *** | -0.343 | 0.028 | *** | -0.338 | 0.028 | *** | -0.343 | 0.031 | *** |
| Socioeconomic status | 0.194 | 0.019 | *** | 0.192 | 0.010 | *** | 0.192 | 0.010 | *** | 0.190 | 0.010 | *** | 0.190 | 0.010 | *** | 0.196 | 0.011 | *** | 0.194 | 0.022 | *** |
| South | 0.053 | 0.014 | *** | 0.031 | 0.024 | | 0.055 | 0.014 | *** | 0.058 | 0.014 | *** | 0.052 | 0.014 | *** | 0.049 | 0.015 | ** | 0.020 | 0.026 | |
| Two-parent | 0.066 | 0.016 | *** | 0.064 | 0.016 | *** | 0.028 | 0.028 | | 0.071 | 0.016 | *** | 0.072 | 0.017 | *** | 0.061 | 0.017 | *** | 0.044 | 0.030 | |
| Number of siblings | -0.022 | 0.004 | *** | -0.023 | 0.004 | *** | -0.023 | 0.004 | *** | -0.022 | 0.004 | *** | -0.023 | 0.004 | *** | -0.023 | 0.004 | *** | -0.023 | 0.005 | *** |
| Mobility | -0.014 | 0.004 | ** | -0.013 | 0.004 | ** | -0.013 | 0.004 | ** | -0.013 | 0.004 | ** | -0.014 | 0.004 | ** | -0.015 | 0.004 | *** | -0.014 | 0.004 | ** |
| **School Factors** | | | | | | | | | | | | | | | | | | | | | |
| Percent Minority | -0.001 | 0.000 | * | -0.001 | 0.000 | ** | -0.001 | 0.000 | ** | -0.001 | 0.000 | ** | -0.001 | 0.000 | * | -0.001 | 0.000 | ** | -0.001 | 0.000 | ** |
| Student/Teacher ratio | -0.003 | 0.002 | + | -0.003 | 0.002 | | -0.003 | 0.002 | + | -0.004 | 0.002 | + | -0.003 | 0.002 | | -0.004 | 0.002 | + | -0.003 | 0.002 | |
| School Poverty | 0.001 | 0.001 | + | 0.001 | 0.001 | + | 0.001 | 0.001 | + | 0.001 | 0.001 | + | 0.001 | 0.001 | + | 0.000 | 0.001 | | 0.000 | 0.001 | |
| % FT Certified Teachers | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | -0.001 | 0.001 | |
| % College Prep | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | |
| % Vocational | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | |
| **Interactions** | | | | | | | | | | | | | | | | | | | | | |
| SES*Urb | 0.029 | 0.027 | | | | | | | | | | | | | | | | | 0.023 | 0.031 | |
| SES*Sub | -0.020 | 0.023 | | | | | | | | | | | | | | | | | -0.021 | 0.027 | |
| South*Urb | | | | 0.045 | 0.037 | | | | | | | | | | | | | | 0.052 | 0.039 | |
| South*Sub | | | | 0.026 | 0.031 | | | | | | | | | | | | | | 0.029 | 0.033 | |
| Two-Parent*Urb | | | | | | | 0.028 | 0.041 | | | | | | | | | | | -0.012 | 0.045 | |
| Two-Parent*Sub | | | | | | | 0.058 | 0.035 | + | | | | | | | | | | 0.064 | 0.039 | + |
| Problem Behavior*Urb | | | | | | | | | | 0.044 | 0.025 | + | | | | | | | 0.048 | 0.029 | |
| Problem Behavior*Sub | | | | | | | | | | 0.020 | 0.024 | | | | | | | | 0.013 | 0.026 | |
| Club Involve*Urb | | | | | | | | | | | | | 0.006 | 0.014 | | | | | -0.001 | 0.016 | |
| Club Involve*Sub | | | | | | | | | | | | | 0.015 | 0.011 | | | | | 0.014 | 0.011 | |
| Sch Poverty*Urban | | | | | | | | | | | | | | | | 0.001 | 0.001 | | 0.001 | 0.001 | |
| Sch Poverty*Sub | | | | | | | | | | | | | | | | 0.001 | 0.001 | | 0.001 | 0.001 | |
| ***Constant*** | 0.005 | 0.082 | | 0.008 | 0.080 | | 0.028 | 0.083 | | 0.018 | 0.088 | | 0.012 | 0.088 | | 0.051 | 0.081 | | 0.110 | 0.095 | |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

*N* = 9,350

**Appendix J: Pooled Analysis of Peer Social Capital including selected interaction terms**

| | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | |
| Urban | 0.000 | 0.032 | | 0.010 | 0.034 | | 0.009 | 0.051 | | 0.015 | 0.055 | |
| Suburban | -0.001 | 0.026 | | -0.006 | 0.029 | | -0.001 | 0.033 | | -0.011 | 0.038 | |
| **Extracurriculum** | | | | | | | | | | | | |
| Problem Behavior | -0.265 | 0.018 | *** | -0.265 | 0.018 | *** | -0.265 | 0.018 | *** | -0.265 | 0.018 | *** |
| Activity Involvement | 0.062 | 0.007 | *** | 0.063 | 0.008 | *** | 0.062 | 0.007 | *** | 0.063 | 0.008 | *** |
| Sport Involvement | 0.022 | 0.009 | * | 0.022 | 0.018 | | 0.022 | 0.009 | * | 0.022 | 0.018 | |
| **Individual Factors** | | | | | | | | | | | | |
| Female | 0.186 | 0.019 | *** | 0.189 | 0.020 | *** | 0.186 | 0.019 | *** | 0.189 | 0.020 | *** |
| Hispanic | 0.120 | 0.032 | *** | 0.122 | 0.033 | *** | 0.119 | 0.031 | *** | 0.123 | 0.033 | *** |
| Black | 0.174 | 0.034 | *** | 0.183 | 0.036 | *** | 0.175 | 0.034 | *** | 0.184 | 0.036 | *** |
| Asian | 0.125 | 0.032 | *** | 0.141 | 0.033 | *** | 0.127 | 0.031 | *** | 0.140 | 0.033 | *** |
| Socioeconomic status | 0.062 | 0.032 | + | 0.082 | 0.015 | *** | 0.080 | 0.015 | *** | 0.062 | 0.033 | + |
| South | 0.039 | 0.026 | | 0.041 | 0.025 | + | 0.037 | 0.026 | | 0.041 | 0.025 | + |
| Two-parent | 0.023 | 0.022 | | 0.029 | 0.022 | | 0.023 | 0.022 | | 0.029 | 0.022 | |
| Number of siblings | 0.001 | 0.007 | | 0.000 | 0.007 | | 0.001 | 0.007 | | 0.000 | 0.007 | |
| Mobility | -0.020 | 0.007 | ** | -0.020 | 0.007 | ** | -0.020 | 0.007 | ** | -0.020 | 0.007 | ** |
| **School Factors** | | | | | | | | | | | | |
| Percent Minority | 0.001 | 0.001 | + | 0.001 | 0.001 | | 0.001 | 0.001 | | 0.001 | 0.001 | |
| Student/Teacher ratio | 0.006 | 0.003 | * | 0.006 | 0.003 | * | 0.006 | 0.003 | * | 0.006 | 0.003 | * |
| School Poverty | -0.001 | 0.001 | | -0.001 | 0.001 | | -0.001 | 0.001 | | -0.001 | 0.001 | |
| % FT Certified Teachers | -0.002 | 0.001 | * | -0.002 | 0.001 | * | -0.002 | 0.001 | * | -0.002 | 0.001 | * |
| % College Prep | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 | |
| % Vocational | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | | 0.000 | 0.001 | |
| **Interactions** | | | | | | | | | | | | |
| SES*Urb | 0.006 | 0.040 | | | | | | | | 0.018 | 0.041 | |
| SES*Sub | 0.033 | 0.036 | | | | | | | | 0.031 | 0.037 | |
| Sport Involve*Urb | | | | -0.015 | 0.022 | | | | | -0.015 | 0.022 | |
| Sport Involve*Sub | | | | 0.011 | 0.023 | | | | | 0.011 | 0.023 | |
| Percent Minority*Urb | | | | | | | 0.000 | 0.001 | | 0.000 | 0.001 | |
| Percent Minority*Sub | | | | | | | 0.000 | 0.001 | | 0.000 | 0.001 | |
| ***Constant*** | -0.218 | 0.127 | + | -0.219 | 0.128 | + | -0.212 | 0.129 | | -0.215 | 0.131 | |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001
*N* = 8,130

**Appendix K: Frequency and Distribution of Students' College-Going Aspirations Measure**

| Code | Category | Frequency | Percent |
|---|---|---|---|
| 1 | Less than high school graduation | 113 | 0.70 |
| 2 | High school graduation or GED only | 923 | 5.68 |
| 3 | Attend or complete a 2-year school | 862 | 5.30 |
| 4 | Attend college, but not complete a 4-year degree | 549 | 3.38 |
| 5 | Graduate from college | 5319 | 32.72 |
| 6 | Obtain a master's degree or equivalent | 3124 | 19.22 |
| 7 | Obtain a PhD, MD, or other advanced degree | 2629 | 16.18 |
| -1 | Don't know | 1409 | 8.67 |
| -2 | Refused | 14 | 0.09 |
| -4 | Nonrespondent | 651 | 4.01 |
| -8 | Legit skip | 276 | 1.70 |
| -9 | Missing | 383 | 2.36 |

**Appendix L: Interaction Models for College-Going Aspirations**

| | β | SE | β | SE | β | SE | β | SE | β | SE | β | SE | β | SE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | | | |
| Urban | 0.532 *** | 0.136 | 0.395 ** | 0.121 | 0.449 * | 0.176 | 0.908 | 0.569 | 0.321 | 0.224 | 0.349 * | 0.138 | 0.559 | 0.662 |
| Suburban | 0.203 * | 0.094 | 0.182 * | 0.087 | -0.042 | 0.145 | 0.350 | 0.423 | 0.268 | 0.179 | 0.026 | 0.107 | 0.017 | 0.484 |
| **Extracurriculum** | | | | | | | | | | | | | | |
| Problem Behavior | -0.412 *** | 0.059 | -0.419 *** | 0.050 | -0.418 *** | 0.051 | -0.418 *** | 0.050 | -0.419 *** | 0.054 | -0.421 *** | 0.050 | -0.422 *** | 0.065 |
| Activity Involvement | 0.153 *** | 0.035 | 0.158 *** | 0.030 | 0.159 *** | 0.030 | 0.163 *** | 0.031 | 0.139 *** | 0.033 | 0.158 *** | 0.030 | 0.147 *** | 0.039 |
| Sport Involvement | 0.075 + | 0.038 | 0.043 | 0.033 | 0.043 | 0.033 | 0.041 | 0.033 | 0.048 | 0.035 | 0.046 | 0.033 | 0.081 + | 0.043 |
| **Noncognitive Resources** | | | | | | | | | | | | | | |
| Technological Capital | 0.208 *** | 0.040 | 0.227 *** | 0.034 | 0.225 *** | 0.034 | 0.223 *** | 0.034 | 0.245 *** | 0.037 | 0.226 *** | 0.034 | 0.225 *** | 0.042 |
| Parental Aspirations | 1.894 *** | 0.079 | 2.076 *** | 0.071 | 2.077 *** | 0.071 | 2.055 *** | 0.073 | 2.112 *** | 0.078 | 2.076 *** | 0.071 | 1.904 *** | 0.088 |
| Intergenerational Closure | -0.104 | 0.086 | 0.053 | 0.051 | 0.053 | 0.050 | 0.051 | 0.052 | 0.073 | 0.056 | 0.053 | 0.050 | -0.040 | 0.096 |
| Parent-child Social Capital | 0.056 | 0.068 | 0.060 | 0.072 | 0.057 | 0.072 | 0.069 | 0.075 | 0.027 | 0.082 | 0.058 | 0.072 | 0.029 | 0.079 |
| Peer Social Capital | 0.402 *** | 0.048 | 0.392 *** | 0.042 | 0.392 *** | 0.042 | 0.377 *** | 0.044 | 0.404 *** | 0.042 | 0.392 *** | 0.042 | 0.403 *** | 0.053 |
| **Distance to College** | | | | | | | | | | | | | | |
| Distance | 0.000 | 0.004 | 0.001 | 0.003 | 0.001 | 0.003 | 0.000 | 0.003 | 0.003 | 0.003 | -0.007 | 0.005 | -0.007 | 0.005 |
| **Individual Controls** | | | | | | | | | | | | | | |
| Female | 0.399 *** | 0.071 | 0.322 *** | 0.063 | 0.322 *** | 0.063 | 0.322 *** | 0.064 | 0.316 *** | 0.068 | 0.326 *** | 0.063 | 0.375 *** | 0.079 |
| Hispanic | -0.369 ** | 0.118 | -0.285 ** | 0.107 | -0.282 ** | 0.107 | -0.309 ** | 0.107 | -0.187 | 0.121 | -0.283 ** | 0.107 | -0.303 * | 0.137 |
| Black | -0.151 | 0.131 | -0.108 | 0.115 | -0.115 | 0.116 | -0.146 | 0.117 | -0.072 | 0.131 | -0.108 | 0.116 | -0.137 | 0.151 |
| Asian | -0.054 | 0.170 | -0.034 | 0.138 | -0.016 | 0.139 | -0.050 | 0.139 | 0.051 | 0.166 | -0.025 | 0.139 | 0.147 | 0.199 |
| SES | 0.555 *** | 0.063 | 0.450 *** | 0.100 | 0.508 *** | 0.055 | 0.506 *** | 0.055 | 0.511 *** | 0.058 | 0.510 *** | 0.054 | 0.535 *** | 0.122 |
| South | 0.080 | 0.082 | 0.084 | 0.072 | 0.081 | 0.072 | 0.061 | 0.075 | 0.118 | 0.079 | 0.072 | 0.072 | 0.066 | 0.091 |
| Two-parent | 0.140 + | 0.078 | 0.143 * | 0.067 | 0.039 | 0.135 | 0.138 * | 0.067 | 0.157 * | 0.073 | 0.148 * | 0.067 | -0.002 | 0.162 |
| Number of siblings | -0.007 | 0.025 | -0.013 | 0.025 | -0.012 | 0.025 | -0.013 | 0.025 | -0.011 | 0.029 | -0.013 | 0.025 | -0.004 | 0.028 |
| Mobility | -0.034 | 0.024 | -0.025 | 0.022 | -0.024 | 0.022 | -0.021 | 0.022 | -0.020 | 0.024 | -0.025 | 0.022 | -0.021 | 0.027 |
| **School Factors** | | | | | | | | | | | | | | |
| Percent minority enrollment | 0.003 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.003 | 0.002 | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.002 |
| Student/teacher ratio | -0.017 | 0.011 | -0.025 * | 0.010 | -0.025 * | 0.010 | -0.009 | 0.023 | -0.019 + | 0.011 | -0.025 ** | 0.010 | -0.005 | 0.023 |
| Percent receiving free/reduced price lunch | -0.003 | 0.003 | -0.003 | 0.003 | -0.003 | 0.003 | -0.003 | 0.003 | -0.004 | 0.003 | -0.002 | 0.003 | -0.004 | 0.004 |
| Percent of FT teachers certified | 0.001 | 0.004 | 0.000 | 0.003 | 0.000 | 0.003 | -0.001 | 0.003 | -0.002 | 0.003 | 0.000 | 0.003 | -0.001 | 0.005 |
| Percent enrolled in college prep | 0.004 ** | 0.001 | 0.004 ** | 0.001 | 0.004 ** | 0.001 | 0.004 ** | 0.001 | 0.005 * | 0.002 | 0.004 ** | 0.001 | 0.004 + | 0.002 |
| Percent enrolled in vocational/technical | -0.004 + | 0.002 | -0.003 | 0.002 | -0.003 | 0.002 | -0.002 | 0.002 | -0.004 + | 0.002 | -0.003 | 0.002 | -0.004 | 0.002 |
| Interaction Terms | | | | | | | | | | | | | | |
| Intergenerational Closure*Urb | 0.216 | 0.143 | | | | | | | | | | | 0.135 | 0.163 |
| Intergenerational Closure*Sub | 0.252 * | 0.110 | | | | | | | | | | | 0.206 + | 0.125 |
| SES*Urb | | | -0.044 | 0.132 | | | | | | | | | -0.146 | 0.172 |
| SES*Sub | | | 0.140 | 0.120 | | | | | | | | | 0.057 | 0.147 |
| Two-parent*Urb | | | | | -0.066 | 0.191 | | | | | | | -0.003 | 0.252 |
| Two-parent*Sub | | | | | 0.250 | 0.159 | | | | | | | 0.260 | 0.195 |
| Student/teacher ratio*Urb | | | | | | | -0.032 | 0.034 | | | | | -0.020 | 0.035 |
| Student/teacher ratio*Sub | | | | | | | -0.015 | 0.027 | | | | | -0.009 | 0.028 |
| %College Prep*Urb | | | | | | | | | 0.002 | 0.003 | | | 0.001 | 0.004 |
| %College Prep*Sub | | | | | | | | | -0.002 | 0.003 | | | 0.000 | 0.003 |
| Distance*Urb | | | | | | | | | | | -0.006 | 0.024 | 0.023 | 0.037 |
| Distance*Sub | | | | | | | | | | | 0.011 + | 0.005 | 0.013 * | 0.007 |
| *Constant* | -0.056 | 0.470 | 0.021 | 0.351 | 0.140 | 0.367 | -0.103 | 0.434 | 0.033 | 0.378 | 0.158 | 0.353 | 0.158 | 0.566 |

Note: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001
*N* = 9,520

**Appendix M: Interaction models for tenth grade math achievement**

| | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | | | | | | | |
| Urban | -0.441 | 0.471 | | -0.310 | 0.491 | | -0.351 | 0.562 | | 0.046 | 0.562 | | -2.012 | 0.919 | * | -0.868 | 0.752 | | -1.252 | 1.421 | |
| Suburb | 0.032 | 0.342 | | 0.120 | 0.365 | | 0.110 | 0.397 | | 0.969 | 0.444 | * | -0.929 | 0.749 | | 0.027 | 0.463 | | 0.437 | 1.024 | |
| **Extracurriculum** | | | | | | | | | | | | | | | | | | |
| Problem Behavior | -1.698 | 0.197 | *** | -1.815 | 0.218 | *** | -1.911 | 0.224 | *** | -1.712 | 0.190 | *** | -1.736 | 0.198 | *** | -1.740 | 0.199 | *** | -2.126 | 0.269 | *** |
| Activity Involvement | 1.081 | 0.095 | *** | 1.070 | 0.102 | *** | 1.152 | 0.110 | *** | 1.076 | 0.095 | *** | 1.053 | 0.104 | *** | 1.097 | 0.105 | *** | 1.151 | 0.125 | *** |
| Sport Involvement | -0.409 | 0.100 | *** | -0.371 | 0.112 | ** | -0.450 | 0.126 | *** | -0.433 | 0.098 | *** | -0.423 | 0.112 | *** | -0.419 | 0.122 | ** | -0.423 | 0.159 | ** |
| **Noncognitive Resources** | | | | | | | | | | | | | | | | | | |
| Technological Capital | 0.802 | 0.126 | *** | 0.720 | 0.145 | *** | 0.756 | 0.158 | *** | 0.796 | 0.122 | *** | 0.791 | 0.135 | *** | 0.778 | 0.137 | *** | 0.775 | 0.199 | *** |
| Parental Aspirations | 5.502 | 0.310 | *** | 5.368 | 0.313 | *** | 5.805 | 0.388 | *** | 5.435 | 0.298 | *** | 5.464 | 0.318 | *** | 5.486 | 0.320 | *** | 5.671 | 0.418 | *** |
| Intergenerational Closure | 0.451 | 0.145 | ** | 0.285 | 0.292 | | 0.651 | 0.177 | *** | 0.491 | 0.145 | ** | 0.510 | 0.162 | ** | 0.532 | 0.172 | ** | 0.277 | 0.371 | |
| Parent-Child Social Capital | -1.822 | 0.195 | *** | -1.846 | 0.197 | *** | -2.045 | 0.247 | *** | -1.779 | 0.199 | *** | -1.890 | 0.212 | *** | -1.824 | 0.206 | *** | -2.097 | 0.256 | *** |
| Peer Social Capital | -0.383 | 0.140 | ** | -0.379 | 0.161 | * | -0.697 | 0.324 | * | -0.395 | 0.146 | ** | -0.401 | 0.162 | * | -0.396 | 0.158 | * | -0.771 | 0.375 | * |
| **Distance to nearest college** | | | | | | | | | | | | | | | | | | |
| Distance | 0.013 | 0.013 | | 0.018 | 0.014 | | 0.011 | 0.015 | | 0.080 | 0.022 | *** | 0.014 | 0.014 | | 0.015 | 0.014 | | 0.082 | 0.025 | ** |
| **Aspirations** | | | | | | | | | | | | | | | | | | |
| College-Going Aspirations | 4.967 | 0.327 | *** | 4.971 | 0.361 | *** | 4.703 | 0.410 | *** | 4.971 | 0.335 | *** | 5.044 | 0.394 | *** | 5.004 | 0.387 | *** | 4.864 | 0.528 | *** |
| **Individual Controls** | | | | | | | | | | | | | | | | | | |
| Female | -2.728 | 0.223 | *** | -2.787 | 0.245 | *** | -2.853 | 0.267 | *** | -2.529 | 0.216 | *** | -2.382 | 0.236 | *** | -2.430 | 0.241 | *** | -2.800 | 0.319 | *** |
| Hispanic | -3.941 | 0.407 | *** | -4.019 | 0.430 | *** | -3.868 | 0.476 | *** | -3.618 | 0.394 | *** | -3.336 | 0.444 | *** | -3.327 | 0.454 | *** | -3.735 | 0.578 | *** |
| Black | -6.456 | 0.391 | *** | -6.553 | 0.430 | *** | -6.742 | 0.470 | *** | -6.178 | 0.389 | *** | -6.132 | 0.429 | *** | -6.036 | 0.428 | *** | -7.026 | 0.562 | *** |
| Asian | 0.266 | 0.530 | | 0.118 | 0.577 | | 0.556 | 0.606 | | 0.640 | 0.518 | | 0.942 | 0.593 | | 0.919 | 0.574 | | 0.691 | 0.723 | |
| Socioeconomic status | 2.739 | 0.343 | *** | 3.238 | 0.196 | *** | 3.010 | 0.216 | *** | 3.012 | 0.187 | *** | 3.098 | 0.207 | *** | 3.086 | 0.206 | *** | 3.475 | 0.471 | *** |
| South | 0.626 | 0.337 | + | 0.550 | 0.354 | | 0.750 | 0.389 | + | 0.718 | 0.321 | * | 0.605 | 0.371 | | 0.660 | 0.361 | + | 0.566 | 0.444 | |
| Two-parent | 0.183 | 0.249 | | 0.167 | 0.277 | | 0.485 | 0.303 | | 0.168 | 0.244 | | 0.187 | 0.274 | | 0.238 | 0.274 | | 0.575 | 0.389 | |
| Number of siblings | -0.361 | 0.075 | *** | -0.360 | 0.079 | *** | -0.333 | 0.085 | *** | -0.359 | 0.072 | *** | -0.348 | 0.077 | *** | -0.348 | 0.079 | *** | -0.262 | 0.104 | |
| Mobility | -0.356 | 0.074 | *** | -0.340 | 0.076 | *** | -0.341 | 0.085 | *** | -0.368 | 0.073 | *** | -0.386 | 0.078 | *** | -0.379 | 0.078 | *** | -0.349 | 0.097 | *** |
| **School Controls** | | | | | | | | | | | | | | | | | | |
| Percent Minority | -0.006 | 0.009 | | -0.005 | 0.009 | | -0.002 | 0.011 | | -0.007 | 0.009 | | -0.009 | 0.011 | | -0.010 | 0.011 | | -0.003 | 0.013 | |
| Student/Teacher ratio | -0.008 | 0.043 | | -0.010 | 0.044 | | 0.013 | 0.049 | | -0.010 | 0.041 | | -0.028 | 0.048 | | -0.015 | 0.048 | | 0.024 | 0.056 | |
| School Poverty | -0.063 | 0.014 | *** | -0.060 | 0.014 | *** | -0.066 | 0.017 | *** | -0.066 | 0.014 | *** | -0.058 | 0.016 | *** | -0.059 | 0.016 | *** | -0.056 | 0.021 | ** |
| % FT Certified Teachers | -0.012 | 0.020 | | -0.016 | 0.020 | | -0.005 | 0.022 | | -0.009 | 0.019 | | -0.006 | 0.020 | | -0.008 | 0.021 | | -0.005 | 0.027 | |
| % College Prep | 0.011 | 0.005 | * | 0.010 | 0.005 | * | 0.012 | 0.006 | * | 0.010 | 0.005 | + | -0.002 | 0.008 | | 0.011 | 0.006 | * | 0.000 | 0.010 | |
| % Vocational | -0.011 | 0.009 | | -0.008 | 0.010 | | -0.014 | 0.009 | | -0.011 | 0.009 | | -0.009 | 0.010 | | -0.004 | 0.011 | | -0.006 | 0.012 | |
| **Interaction terms** | | | | | | | | | | | | | | | | | | |
| SES*Urb | 0.105 | 0.438 | | | | | | | | | | | | | | | | | -0.565 | 0.651 | |
| SES*Sub | 0.450 | 0.395 | | | | | | | | | | | | | | | | | 0.067 | 0.548 | |
| Intergenerational Closure*Urb | | | | -0.384 | 0.420 | | | | | | | | | | | | | | 0.236 | 0.582 | |
| Intergenerational Closure*Sub | | | | 0.445 | 0.357 | | | | | | | | | | | | | | 0.794 | 0.465 | + |
| Peer Social Capital*Urb | | | | | | | 0.268 | 0.445 | | | | | | | | | | | 0.348 | 0.593 | |
| Peer Social Capital*Sub | | | | | | | 0.278 | 0.385 | | | | | | | | | | | 0.359 | 0.463 | |
| Distance*Urb | | | | | | | | | | 0.025 | 0.109 | | | | | | | | 0.215 | 0.248 | |
| Distance*Sub | | | | | | | | | | -0.095 | 0.024 | *** | | | | | | | -0.095 | 0.028 | ** |
| College Prep*Urb | | | | | | | | | | | | | 0.024 | 0.015 | | | | | 0.016 | 0.019 | |
| College Prep*Sub | | | | | | | | | | | | | 0.011 | 0.011 | | | | | 0.013 | 0.013 | |
| Vocational/Technical*Urb | | | | | | | | | | | | | | | | 0.004 | 0.029 | | 0.016 | 0.036 | |
| Vocational/Technical*Sub | | | | | | | | | | | | | | | | -0.016 | 0.015 | | -0.012 | 0.017 | |
| ***Constant*** | 35.442 | 2.104 | *** | 36.026 | 2.197 | *** | 34.296 | 2.335 | *** | 34.340 | 2.079 | *** | 35.773 | 2.291 | *** | 34.825 | 2.305 | *** | 33.635 | 2.903 | *** |

**Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$**

$N = 9,320$

**Appendix N: Interaction models for Test score gains**

| | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | | | | | | | |
| Urban | 0.212 | 0.278 | | 0.418 | 0.299 | | 0.471 | 0.398 | | -0.449 | 0.548 | | 0.189 | 0.335 | | -2.362 | 1.400 | + | -5.541 | 2.203 | * |
| Suburban | 0.230 | 0.219 | | 0.372 | 0.237 | | 0.378 | 0.268 | | -0.423 | 0.457 | | 0.477 | 0.294 | | -0.223 | 1.376 | | -0.386 | 1.849 | |
| **Extracurriculum** | | | | | | | | | | | | | | | | | | |
| Problem Behavior | -1.100 | 0.141 | *** | -1.316 | 0.167 | *** | -1.087 | 0.139 | *** | -1.204 | 0.148 | *** | -1.088 | 0.139 | *** | -1.065 | 0.140 | *** | -1.507 | 0.169 | *** |
| Activity Involvement | 0.491 | 0.064 | *** | 0.485 | 0.066 | *** | 0.499 | 0.063 | *** | 0.448 | 0.068 | *** | 0.496 | 0.062 | *** | 0.491 | 0.063 | *** | 0.441 | 0.073 | *** |
| Sport Involvement | -0.171 | 0.076 | * | -0.129 | 0.087 | | -0.182 | 0.076 | * | -0.160 | 0.090 | + | -0.189 | 0.077 | * | -0.165 | 0.074 | * | -0.080 | 0.100 | |
| **Noncognitive Resources** | | | | | | | | | | | | | | | | | | |
| Technological Capital | 0.239 | 0.083 | ** | 0.162 | 0.096 | + | 0.247 | 0.079 | ** | 0.223 | 0.089 | * | 0.252 | 0.079 | ** | 0.235 | 0.080 | ** | 0.135 | 0.105 | |
| Parental Aspirations | 1.555 | 0.255 | *** | 1.427 | 0.234 | *** | 1.548 | 0.260 | *** | 1.613 | 0.279 | *** | 1.553 | 0.259 | *** | 1.542 | 0.263 | *** | 1.439 | 0.257 | *** |
| Intergenerational Closure | 0.272 | 0.111 | * | 0.043 | 0.226 | | 0.298 | 0.110 | ** | 0.390 | 0.119 | ** | 0.295 | 0.110 | ** | 0.260 | 0.112 | * | 0.092 | 0.246 | |
| Parent-Child Social Capital | -0.719 | 0.139 | *** | -0.668 | 0.153 | *** | -0.737 | 0.141 | *** | -0.826 | 0.154 | *** | -0.738 | 0.142 | *** | -0.696 | 0.148 | *** | -0.775 | 0.173 | *** |
| Peer Social Capital | -0.114 | 0.102 | | -0.094 | 0.118 | | -0.119 | 0.101 | | -0.140 | 0.121 | | -0.117 | 0.101 | | -0.104 | 0.101 | | -0.108 | 0.125 | |
| **Distance to college** | | | | | | | | | | | | | | | | | | |
| Distance | 0.003 | 0.008 | | -0.001 | 0.008 | | 0.004 | 0.008 | | 0.008 | 0.009 | | 0.023 | 0.014 | + | 0.004 | 0.008 | | 0.021 | 0.014 | |
| **Aspirations** | | | | | | | | | | | | | | | | | | |
| College-Going Aspirations | 0.933 | 0.243 | *** | 0.959 | 0.273 | ** | 0.970 | 0.241 | *** | 0.987 | 0.263 | *** | 0.976 | 0.242 | *** | 1.028 | 0.246 | *** | 0.939 | 0.314 | ** |
| **Individual Factors** | | | | | | | | | | | | | | | | | | |
| Female | -1.183 | 0.151 | *** | -1.291 | 0.156 | *** | -1.177 | 0.147 | *** | -1.171 | 0.162 | *** | -1.181 | 0.147 | *** | -1.200 | 0.149 | *** | -1.319 | 0.169 | *** |
| Hispanic | -0.215 | 0.265 | | -0.081 | 0.278 | | -0.190 | 0.263 | | -0.162 | 0.283 | | -0.226 | 0.261 | | -0.139 | 0.261 | | -0.114 | 0.297 | |
| Black | -0.627 | 0.251 | * | -0.701 | 0.280 | * | -0.588 | 0.244 | * | -0.430 | 0.270 | | -0.605 | 0.244 | * | -0.538 | 0.246 | * | -0.495 | 0.302 | |
| Asian | 1.353 | 0.326 | *** | 1.730 | 0.369 | *** | 1.359 | 0.323 | *** | 1.417 | 0.364 | *** | 1.342 | 0.320 | *** | 1.237 | 0.321 | *** | 1.722 | 0.421 | *** |
| Socioeconomic status | 0.981 | 0.231 | *** | 0.995 | 0.142 | *** | 1.048 | 0.132 | *** | 1.093 | 0.141 | *** | 1.051 | 0.132 | *** | 1.088 | 0.127 | *** | 1.272 | 0.268 | *** |
| South | -0.117 | 0.185 | | -0.215 | 0.197 | | -0.146 | 0.179 | | -0.068 | 0.201 | | -0.106 | 0.178 | | -0.127 | 0.178 | | -0.257 | 0.217 | |
| Two-parent | 0.141 | 0.174 | | 0.115 | 0.187 | | 0.140 | 0.174 | | 0.121 | 0.196 | | 0.135 | 0.174 | | 0.191 | 0.177 | | 0.129 | 0.208 | |
| Number of siblings | -0.115 | 0.052 | * | -0.124 | 0.059 | * | -0.118 | 0.051 | * | -0.109 | 0.057 | + | -0.118 | 0.051 | * | -0.120 | 0.052 | * | -0.100 | 0.066 | |
| Mobility | -0.082 | 0.054 | | -0.066 | 0.057 | | -0.085 | 0.051 | + | -0.091 | 0.057 | | -0.086 | 0.051 | + | -0.075 | 0.051 | | -0.057 | 0.063 | |
| **School Factors** | | | | | | | | | | | | | | | | | | |
| Percent Minority | 0.005 | 0.004 | | 0.004 | 0.005 | | 0.013 | 0.006 | + | 0.007 | 0.005 | | 0.005 | 0.004 | | 0.003 | 0.004 | | 0.013 | 0.008 | |
| Student/Teacher ratio | 0.018 | 0.025 | | -0.003 | 0.027 | | 0.024 | 0.024 | | 0.051 | 0.027 | + | 0.029 | 0.024 | | 0.033 | 0.024 | | 0.033 | 0.030 | |
| School Poverty | -0.023 | 0.007 | ** | -0.025 | 0.008 | ** | -0.024 | 0.007 | *** | -0.025 | 0.007 | ** | -0.025 | 0.007 | *** | -0.023 | 0.007 | ** | -0.028 | 0.008 | ** |
| % FT Certified Teachers | -0.006 | 0.009 | | -0.003 | 0.011 | | -0.006 | 0.008 | | -0.007 | 0.009 | | -0.006 | 0.009 | | -0.021 | 0.009 | * | -0.030 | 0.010 | ** |
| % College Prep | 0.008 | 0.003 | ** | 0.009 | 0.003 | ** | 0.008 | 0.003 | * | -0.001 | 0.006 | | 0.007 | 0.003 | * | 0.008 | 0.003 | ** | 0.001 | 0.006 | |
| % Vocational | -0.002 | 0.004 | | -0.002 | 0.004 | | -0.002 | 0.004 | | -0.002 | 0.004 | | -0.002 | 0.004 | | -0.002 | 0.004 | | -0.004 | 0.005 | |
| **Interaction terms** | | | | | | | | | | | | | | | | | | |
| SES*Urb | 0.013 | 0.296 | | | | | | | | | | | | | | | | |
| SES*Sub | 0.125 | 0.266 | | | | | | | | | | | | | | | | |
| Intergenerational Closure*Urb | | | | 0.094 | 0.314 | | | | | | | | | | | | | |
| Intergenerational Closure*Sub | | | | 0.417 | 0.272 | | | | | | | | | | | | | |
| Percent Minority*Urb | | | | | | | -0.010 | 0.008 | | | | | | | | | | |
| Percent Minority*Sub | | | | | | | -0.009 | 0.007 | | | | | | | | | | |
| College Prep*Urb | | | | | | | | | | 0.009 | 0.008 | | | | | | | |
| College Prep*Sub | | | | | | | | | | 0.010 | 0.007 | | | | | | | |
| Distance*Urb | | | | | | | | | | | | | 0.100 | 0.050 | * | | | |
| Distance*Sub | | | | | | | | | | | | | -0.030 | 0.015 | + | | | |
| FT Certified Teachers*Urb | | | | | | | | | | | | | | | | 0.026 | 0.014 | + |
| FT Certified Teachers*Sub | | | | | | | | | | | | | | | | 0.004 | 0.014 | |
| ***Constant*** | 8.492 | 1.126 | *** | 8.682 | 1.319 | *** | 8.311 | 1.037 | *** | 8.434 | 1.182 | *** | 8.111 | 1.058 | *** | 9.577 | 1.060 | *** |

**Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$**

$N = 9{,}320$

**Appendix O: OLS results for Test Score Gains, including students' test scores**

| | Urban | | | Suburb | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | | SE | $\beta$ | | SE | $\beta$ | | SE |
| **Extracurriculum** | | | | | | | | | |
| Problem Behavior | -0.573 | * | 0.248 | -1.222 | *** | 0.233 | -1.067 | *** | 0.260 |
| Activity Involvement | 0.480 | *** | 0.129 | 0.444 | *** | 0.090 | 0.359 | ** | 0.125 |
| Sport Involvement | -0.207 | | 0.148 | -0.176 | | 0.106 | -0.072 | | 0.149 |
| **Noncognitive Resources** | | | | | | | | | |
| Technological Capital | 0.451 | ** | 0.148 | 0.136 | | 0.129 | 0.080 | | 0.187 |
| Parental Aspirations | 1.261 | ** | 0.430 | 1.666 | *** | 0.362 | 0.505 | | 0.445 |
| Intergenerational Closure | 0.138 | | 0.192 | 0.444 | ** | 0.160 | 0.026 | | 0.256 |
| Parent-Child Social Capital | -0.509 | + | 0.285 | -0.862 | *** | 0.209 | -0.386 | | 0.293 |
| Peer Social Capital | -0.178 | | 0.226 | -0.024 | | 0.155 | -0.237 | | 0.249 |
| **Distance to nearest college** | | | | | | | | | |
| Distance | 0.129 | ** | 0.039 | -0.006 | | 0.007 | 0.027 | + | 0.015 |
| **Aspirations** | | | | | | | | | |
| College-Going Aspirations | 0.225 | | 0.498 | 0.696 | * | 0.308 | 1.251 | * | 0.485 |
| **High Scoring Students**[a] | -3.132 | *** | 0.490 | -1.852 | *** | 0.428 | -1.685 | ** | 0.534 |
| **Average Scoring Students**[a] | -2.233 | *** | 0.375 | -0.561 | + | 0.326 | -0.832 | * | 0.376 |
| **Individual Controls** | | | | | | | | | |
| Female | -1.112 | *** | 0.275 | -0.732 | ** | 0.212 | -1.466 | *** | 0.331 |
| Hispanic | -0.579 | | 0.482 | 0.307 | | 0.375 | -0.196 | | 0.706 |
| Black | -0.164 | | 0.439 | -0.164 | | 0.375 | -0.859 | | 0.565 |
| Asian | 0.675 | | 0.507 | 1.614 | ** | 0.484 | 1.701 | + | 0.915 |
| Socioeconomic status | 0.499 | * | 0.241 | 0.943 | *** | 0.199 | 0.998 | ** | 0.284 |
| South | 0.233 | | 0.354 | -0.351 | | 0.253 | -0.242 | | 0.370 |
| Two-parent | 0.473 | | 0.333 | -0.056 | | 0.256 | 0.183 | | 0.349 |
| Number of siblings | -0.066 | | 0.093 | -0.034 | | 0.074 | -0.239 | * | 0.116 |
| Mobility | -0.065 | | 0.110 | -0.138 | + | 0.074 | 0.063 | | 0.111 |
| **School Controls** | | | | | | | | | |
| Percent Minority | 0.002 | | 0.009 | -0.002 | | 0.006 | 0.021 | * | 0.009 |
| Student/Teacher ratio | -0.014 | | 0.055 | 0.065 | + | 0.034 | 0.020 | | 0.049 |
| School Poverty | -0.012 | | 0.016 | -0.013 | | 0.008 | -0.038 | * | 0.016 |
| % FT Certified Teachers | 0.005 | | 0.013 | -0.014 | | 0.010 | -0.015 | | 0.012 |
| % College Prep | 0.008 | | 0.005 | 0.010 | * | 0.004 | 0.000 | | 0.006 |
| % Vocational | 0.001 | | 0.006 | -0.006 | | 0.005 | 0.002 | | 0.009 |
| ***Constant*** | 10.454 | *** | 2.162 | 9.456 | *** | 1.270 | 11.098 | *** | 1.535 |
| ***N*** | | | 2,320 | | | 4,740 | | | 2,250 |

**Note**: Significance levels: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

[a]: Reference group is Low Scoring Students

**Appendix P: Interaction Models for general college attendance**

| | β | S.E. | | β | S.E. | | β | S.E. | | β | S.E. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spatial Context** | | | | | | | | | | | | |
| Urban | 0.035 | 0.105 | | 0.084 | 0.112 | | 0.046 | 0.124 | | 0.104 | 0.130 | |
| Suburban | -0.034 | 0.084 | | 0.015 | 0.089 | | 0.049 | 0.106 | | 0.081 | 0.108 | |
| **Extracurriculum** | | | | | | | | | | | | |
| Problem Behavior | -0.474 | 0.053 | *** | -0.482 | 0.060 | *** | -0.484 | 0.060 | *** | -0.491 | 0.060 | *** |
| Activity Involvement | 0.123 | 0.025 | *** | 0.111 | 0.029 | *** | 0.114 | 0.029 | *** | 0.115 | 0.029 | *** |
| Sport Involvement | 0.099 | 0.028 | *** | 0.127 | 0.032 | *** | 0.124 | 0.033 | *** | 0.135 | 0.033 | *** |
| **Noncognitive Resources** | | | | | | | | | | | | |
| Technological Capital | 0.171 | 0.030 | *** | 0.167 | 0.034 | *** | 0.163 | 0.034 | *** | 0.173 | 0.035 | *** |
| Parental Aspirations | 0.696 | 0.074 | *** | 0.812 | 0.074 | *** | 0.802 | 0.073 | *** | 0.803 | 0.074 | *** |
| Intergenerational Closure | 0.133 | 0.045 | ** | 0.256 | 0.101 | * | 0.165 | 0.047 | ** | 0.233 | 0.102 | * |
| Parent-Child Social Capital | 0.103 | 0.054 | + | 0.133 | 0.060 | * | 0.153 | 0.059 | ** | 0.136 | 0.061 | * |
| Peer Social Capital | 0.083 | 0.041 | * | 0.067 | 0.043 | | 0.064 | 0.042 | | 0.071 | 0.045 | |
| **Distance to nearest college** | | | | | | | | | | | | |
| Distance | -0.006 | 0.003 | + | -0.007 | 0.003 | * | -0.007 | 0.003 | * | -0.007 | 0.003 | * |
| **Aspirations/Achievement** | | | | | | | | | | | | |
| Students' aspirations | 0.564 | 0.074 | *** | 0.560 | 0.089 | *** | 0.552 | 0.086 | *** | 0.553 | 0.087 | *** |
| Gr. 10 Math | 0.044 | 0.003 | *** | 0.041 | 0.003 | *** | 0.041 | 0.003 | *** | 0.041 | 0.003 | *** |
| Test Score Gains | 0.038 | 0.005 | *** | 0.040 | 0.005 | *** | 0.041 | 0.005 | *** | 0.041 | 0.005 | *** |
| **Individual Factors** | | | | | | | | | | | | |
| Female | 0.419 | 0.057 | *** | 0.509 | 0.066 | *** | 0.488 | 0.066 | *** | 0.507 | 0.067 | *** |
| Hispanic | 0.133 | 0.095 | | 0.221 | 0.105 | * | 0.199 | 0.106 | + | 0.199 | 0.107 | + |
| Black | 0.371 | 0.097 | *** | 0.455 | 0.110 | *** | 0.470 | 0.109 | *** | 0.430 | 0.110 | *** |
| Asian | 0.815 | 0.144 | *** | 0.885 | 0.164 | *** | 0.954 | 0.165 | *** | 0.852 | 0.166 | *** |
| Socioeconomic status | 0.547 | 0.097 | *** | 0.585 | 0.056 | *** | 0.588 | 0.055 | *** | 0.508 | 0.118 | *** |
| South | -0.215 | 0.072 | ** | -0.191 | 0.078 | * | -0.203 | 0.077 | ** | -0.178 | 0.079 | * |
| Two-parent | -0.049 | 0.063 | | -0.035 | 0.071 | | -0.052 | 0.071 | | -0.050 | 0.072 | |
| Number of siblings | -0.090 | 0.020 | *** | -0.116 | 0.021 | *** | -0.118 | 0.021 | *** | -0.119 | 0.022 | *** |
| Mobility | -0.070 | 0.019 | *** | -0.090 | 0.021 | *** | -0.073 | 0.038 | + | -0.063 | 0.038 | + |
| **School Factors** | | | | | | | | | | | | |
| Percent Minority | 0.002 | 0.002 | | -0.001 | 0.002 | | 0.000 | 0.002 | | 0.000 | 0.002 | |
| Student/Teacher ratio | -0.006 | 0.009 | | -0.001 | 0.009 | | 0.001 | 0.009 | | 0.001 | 0.010 | |
| School Poverty | -0.002 | 0.003 | | -0.001 | 0.003 | | -0.001 | 0.003 | | -0.002 | 0.003 | |
| % FT Certified Teachers | 0.004 | 0.002 | | 0.003 | 0.003 | | 0.003 | 0.003 | | 0.003 | 0.003 | |
| % College Prep | 0.001 | 0.001 | | 0.001 | 0.001 | | 0.001 | 0.001 | | 0.001 | 0.001 | |
| % Vocational | -0.002 | 0.002 | | -0.002 | 0.002 | | -0.001 | 0.002 | | -0.001 | 0.002 | |
| **Interaction terms** | | | | | | | | | | | | |
| SES*Urb | -0.021 | 0.127 | | | | | | | | 0.090 | 0.148 | |
| SES*Sub | -0.019 | 0.114 | | | | | | | | 0.112 | 0.135 | |
| Intergenerational Closure*Urb | | | | -0.057 | 0.132 | | | | | -0.068 | 0.133 | |
| Intergenerational Closure*Sub | | | | -0.126 | 0.117 | | | | | -0.094 | 0.119 | |
| Mobility*Urb | | | | | | | -0.006 | 0.052 | | -0.014 | 0.053 | |
| Mobility*Sub | | | | | | | -0.034 | 0.049 | | -0.043 | 0.049 | |
| ***Constant*** | -2.250 | 0.360 | *** | -2.114 | 0.417 | *** | -2.131 | 0.424 | *** | -2.136 | 0.422 | *** |

Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

$N = 9{,}910$

**Appendix Q: Multinomial Logistic Models (Two-Year Enrollment as reference category)**

| | No Enrollment vs. Two-Year Enrollment | | | | Four-Year Enrollment vs. Two-Year Enrollment | | | |
|---|---|---|---|---|---|---|---|---|
| | $\beta$ | e($\beta$) | S.E. | | $\beta$ | e($\beta$) | S.E. | |
| **Spatial Context** | | | | | | | | |
| Urban | 0.225 | 1.252 | 0.120 | + | 0.519 | 1.680 | 0.146 | *** |
| Suburban | 0.086 | 1.089 | 0.095 | | 0.061 | 1.063 | 0.114 | |
| **Extracurriculum** | | | | | | | | |
| Problem Behavior | 0.300 | 1.350 | 0.052 | *** | -0.404 | 0.668 | 0.071 | *** |
| Activity Involvement | -0.043 | 0.958 | 0.027 | | 0.134 | 1.143 | 0.026 | *** |
| Sport Involvement | -0.049 | 0.953 | 0.030 | | 0.091 | 1.096 | 0.028 | ** |
| **Noncognitive Resources** | | | | | | | | |
| Technological Capital | -0.155 | 0.856 | 0.034 | *** | 0.036 | 1.037 | 0.042 | |
| Parental Aspirations | -0.446 | 0.640 | 0.077 | *** | 0.561 | 1.752 | 0.098 | *** |
| Intergenerational Closure | -0.072 | 0.930 | 0.045 | | 0.121 | 1.128 | 0.045 | * |
| Parent-Child Social Capital | -0.104 | 0.901 | 0.056 | + | 0.012 | 1.012 | 0.063 | |
| Peer Social Capital | -0.060 | 0.942 | 0.048 | | 0.041 | 1.042 | 0.052 | |
| **Distance to nearest college** | | | | | | | | |
| Distance | 0.006 | 1.006 | 0.004 | + | 0.002 | 1.002 | 0.004 | |
| **Aspirations/Achievement** | | | | | | | | |
| Students' aspirations | -0.390 | 0.677 | 0.087 | *** | 0.510 | 1.665 | 0.109 | *** |
| Gr. 10 Math | -0.019 | 0.981 | 0.003 | *** | 0.057 | 1.059 | 0.003 | *** |
| Test Score Gains | -0.016 | 0.984 | 0.005 | ** | 0.049 | 1.050 | 0.005 | *** |
| **Individual Factors** | | | | | | | | |
| Female | -0.329 | 0.720 | 0.059 | *** | 0.176 | 1.192 | 0.055 | ** |
| Hispanic | -0.173 | 0.841 | 0.097 | + | -0.198 | 0.820 | 0.116 | + |
| Black | -0.174 | 0.840 | 0.106 | + | 0.554 | 1.740 | 0.112 | *** |
| Asian | -0.803 | 0.448 | 0.142 | *** | -0.009 | 0.991 | 0.108 | |
| Socioeconomic status | -0.323 | 0.724 | 0.052 | *** | 0.363 | 1.437 | 0.052 | *** |
| South | 0.257 | 1.293 | 0.082 | ** | 0.075 | 1.077 | 0.096 | |
| Two-parent | 0.042 | 1.043 | 0.065 | | -0.027 | 0.973 | 0.076 | |
| Number of siblings | 0.082 | 1.085 | 0.020 | *** | -0.011 | 0.989 | 0.020 | |
| Mobility | 0.052 | 1.053 | 0.021 | * | -0.043 | 0.958 | 0.022 | * |
| **School Factors** | | | | | | | | |
| Percent Minority | -0.001 | 0.999 | 0.002 | | 0.002 | 1.002 | 0.002 | |
| Student/Teacher ratio | -0.006 | 0.994 | 0.010 | | -0.017 | 0.983 | 0.013 | |
| School Poverty | 0.001 | 1.001 | 0.003 | | -0.006 | 0.994 | 0.003 | + |
| % FT Certified Teachers | -0.001 | 0.999 | 0.003 | | 0.006 | 1.006 | 0.003 | * |
| % College Prep | 0.001 | 1.001 | 0.001 | | 0.005 | 1.005 | 0.001 | ** |
| % Vocational | 0.000 | 1.000 | 0.002 | | -0.004 | 0.996 | 0.002 | + |
| ***Constant*** | 1.319 | 3.741 | 0.417 | ** | -4.214 | 0.015 | 0.429 | * |

Note: Levels of significance are indicated as follows: + $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

$N = 9{,}910$

**Appendix R: Correlations for all measures**

| | College | Urban | Suburb | Rural | Female | Hisp. | Black | Asian | SES | South | Two-parent | #Sibs | Mobility | Prob. Beh. | Clubs | Sports | Tech Cap | Parents' Asp. | Intergen. Closure | Par-Child Soc. Cap. | Peer Soc. Cap. | Distance | %Minority | St/Teach. Ratio | %Free Lunch | %FT Teachers | %College Prep | %Voc/Tech |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| College | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urban | 0.00 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Suburban | 0.01 | -0.60 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rural | -0.02 | -0.33 | -0.56 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | |
| Female | 0.11 | 0.01 | -0.01 | 0.00 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | |
| Hispanic | -0.06 | 0.13 | -0.01 | -0.13 | 0.02 | 1.00 | | | | | | | | | | | | | | | | | | | | | | |
| Black | -0.02 | 0.15 | -0.07 | -0.08 | 0.01 | -0.16 | 1.00 | | | | | | | | | | | | | | | | | | | | | |
| Asian | 0.06 | 0.12 | 0.01 | -0.13 | 0.02 | -0.13 | -0.13 | 1.00 | | | | | | | | | | | | | | | | | | | | |
| SES | 0.19 | -0.08 | 0.09 | -0.02 | -0.02 | -0.24 | -0.10 | 0.01 | 1.00 | | | | | | | | | | | | | | | | | | | |
| South | 0.01 | 0.02 | -0.11 | 0.11 | 0.00 | -0.04 | 0.22 | -0.12 | 0.00 | 1.00 | | | | | | | | | | | | | | | | | | |
| Two-parent | 0.04 | -0.08 | 0.04 | 0.04 | -0.01 | 0.00 | -0.22 | 0.06 | 0.17 | -0.07 | 1.00 | | | | | | | | | | | | | | | | | |
| #Siblings | -0.07 | 0.09 | -0.06 | -0.02 | 0.03 | 0.11 | 0.12 | -0.02 | -0.23 | -0.02 | -0.03 | 1.00 | | | | | | | | | | | | | | | | |
| Mobility | -0.04 | 0.06 | -0.03 | -0.02 | -0.01 | 0.06 | 0.05 | 0.00 | -0.04 | 0.08 | -0.07 | 0.12 | 1.00 | | | | | | | | | | | | | | | |
| Prob. Beh. | -0.24 | 0.06 | -0.01 | -0.05 | -0.09 | 0.09 | 0.07 | -0.07 | -0.12 | 0.00 | -0.08 | 0.07 | 0.07 | 1.00 | | | | | | | | | | | | | | |
| Club Engage. | 0.12 | -0.04 | -0.01 | 0.06 | 0.17 | -0.09 | -0.02 | 0.06 | 0.16 | 0.03 | 0.05 | -0.05 | -0.05 | -0.09 | 1.00 | | | | | | | | | | | | | |
| Sport Engage. | 0.02 | -0.05 | -0.05 | 0.12 | -0.08 | -0.02 | 0.04 | -0.09 | 0.02 | -0.03 | -0.02 | 0.02 | -0.05 | 0.03 | 0.09 | 1.00 | | | | | | | | | | | | |
| Tech Cap | 0.17 | -0.07 | 0.05 | 0.01 | -0.01 | -0.17 | -0.15 | 0.08 | 0.33 | -0.05 | 0.14 | -0.16 | -0.06 | -0.12 | 0.09 | 0.01 | 1.00 | | | | | | | | | | | |
| Parents' Asp. | 0.37 | 0.02 | 0.01 | -0.02 | 0.07 | -0.01 | 0.00 | 0.07 | 0.22 | -0.02 | 0.05 | -0.06 | -0.07 | -0.19 | 0.10 | 0.03 | 0.14 | 1.00 | | | | | | | | | | |
| Intergen. Closu | 0.07 | -0.06 | 0.02 | 0.03 | 0.02 | -0.09 | 0.01 | -0.07 | 0.16 | 0.03 | 0.04 | -0.06 | -0.08 | -0.06 | 0.10 | 0.09 | 0.07 | 0.09 | 1.00 | | | | | | | | | |
| Par-Child Soc. | 0.09 | -0.09 | 0.02 | 0.06 | 0.05 | -0.06 | 0.05 | -0.18 | 0.24 | 0.07 | 0.08 | -0.11 | -0.06 | -0.07 | 0.10 | 0.11 | 0.10 | 0.13 | 0.29 | 1.00 | | | | | | | | |
| Peer Soc. Cap. | 0.20 | 0.03 | 0.00 | -0.02 | 0.14 | 0.00 | 0.04 | 0.07 | 0.10 | 0.02 | 0.03 | -0.02 | -0.04 | -0.23 | 0.15 | 0.01 | 0.04 | 0.13 | 0.08 | 0.10 | 1.00 | | | | | | | |
| Distance | -0.02 | -0.27 | 0.00 | 0.28 | 0.02 | -0.07 | -0.10 | -0.08 | -0.09 | -0.05 | 0.03 | 0.03 | -0.03 | -0.04 | 0.03 | 0.11 | -0.03 | -0.02 | 0.03 | 0.04 | -0.03 | 1.00 | | | | | | |
| %Minority | -0.02 | 0.39 | -0.10 | -0.29 | -0.01 | 0.30 | 0.30 | 0.13 | -0.19 | 0.23 | -0.11 | 0.12 | 0.07 | 0.08 | -0.06 | -0.05 | -0.16 | 0.00 | -0.09 | -0.09 | 0.06 | -0.25 | 1.00 | | | | | |
| St/Teach. Ratio | -0.01 | 0.19 | 0.06 | -0.26 | -0.02 | 0.17 | -0.03 | 0.18 | -0.04 | -0.24 | 0.00 | 0.07 | 0.05 | 0.04 | -0.07 | -0.15 | -0.01 | 0.02 | -0.05 | -0.10 | 0.03 | -0.19 | 0.26 | 1.00 | | | | |
| %Free Lunch | -0.07 | 0.26 | -0.13 | -0.11 | -0.02 | 0.25 | 0.25 | -0.03 | -0.34 | 0.13 | -0.12 | 0.18 | 0.03 | 0.09 | -0.04 | 0.05 | -0.23 | -0.05 | -0.06 | -0.08 | 0.00 | 0.01 | 0.65 | 0.08 | 1.00 | | | |
| %FT Teachers | 0.01 | -0.13 | 0.04 | 0.08 | 0.01 | -0.12 | -0.03 | -0.06 | 0.06 | -0.02 | 0.05 | -0.03 | 0.01 | -0.04 | 0.04 | 0.00 | 0.03 | -0.01 | 0.02 | 0.03 | -0.03 | 0.07 | -0.21 | -0.16 | -0.21 | 1.00 | | |
| %College Prep | 0.07 | -0.03 | 0.01 | 0.01 | 0.00 | -0.03 | -0.03 | 0.08 | 0.17 | -0.03 | 0.03 | -0.09 | -0.01 | -0.05 | 0.03 | -0.04 | 0.10 | 0.09 | 0.01 | 0.02 | 0.04 | -0.12 | -0.05 | 0.03 | -0.26 | 0.01 | 1.00 | |
| %Voc/Tech | -0.03 | 0.10 | -0.08 | 0.00 | -0.01 | 0.04 | 0.05 | -0.03 | -0.07 | 0.20 | -0.03 | 0.01 | 0.02 | 0.00 | 0.02 | 0.04 | -0.04 | -0.04 | -0.04 | 0.01 | 0.01 | 0.02 | 0.10 | -0.18 | 0.10 | 0.05 | 0.02 | 1.00 |

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